June 28, 1948

STEEL

The Magazine of Metalworking and Metalproducing

ESTABLISHED 1882

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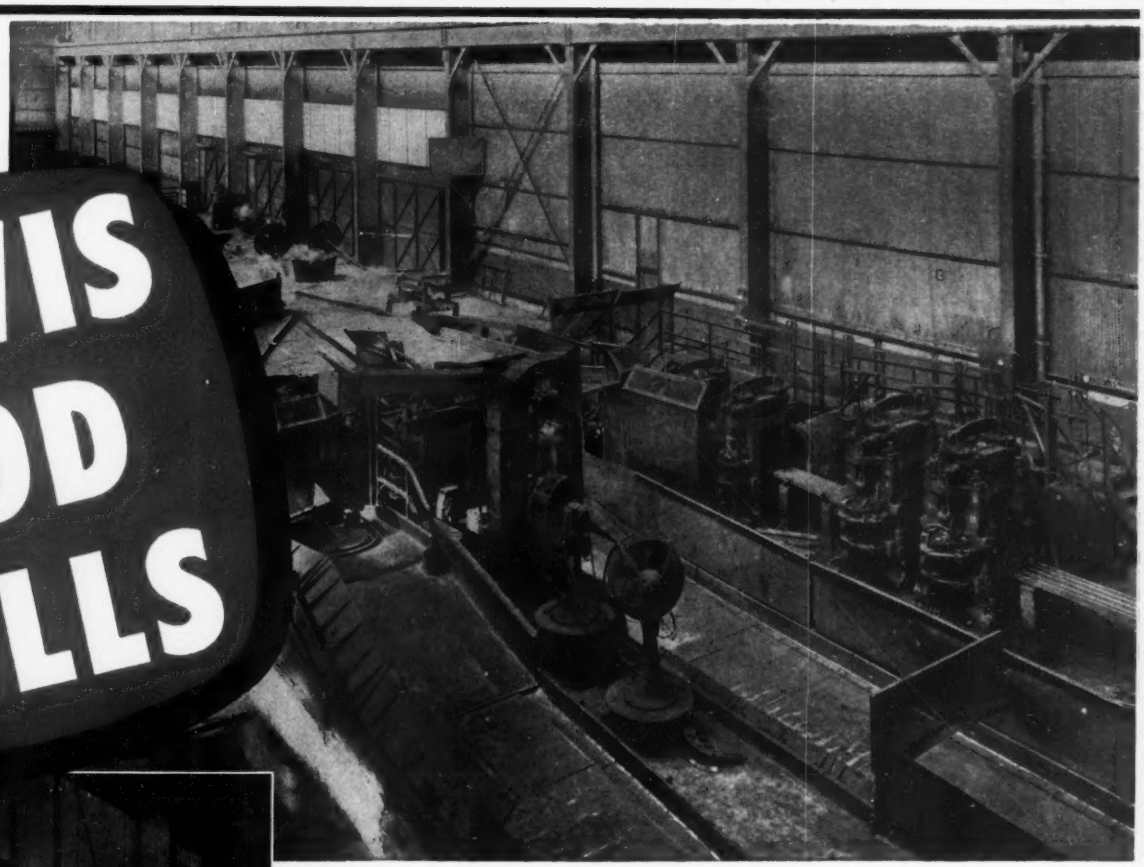

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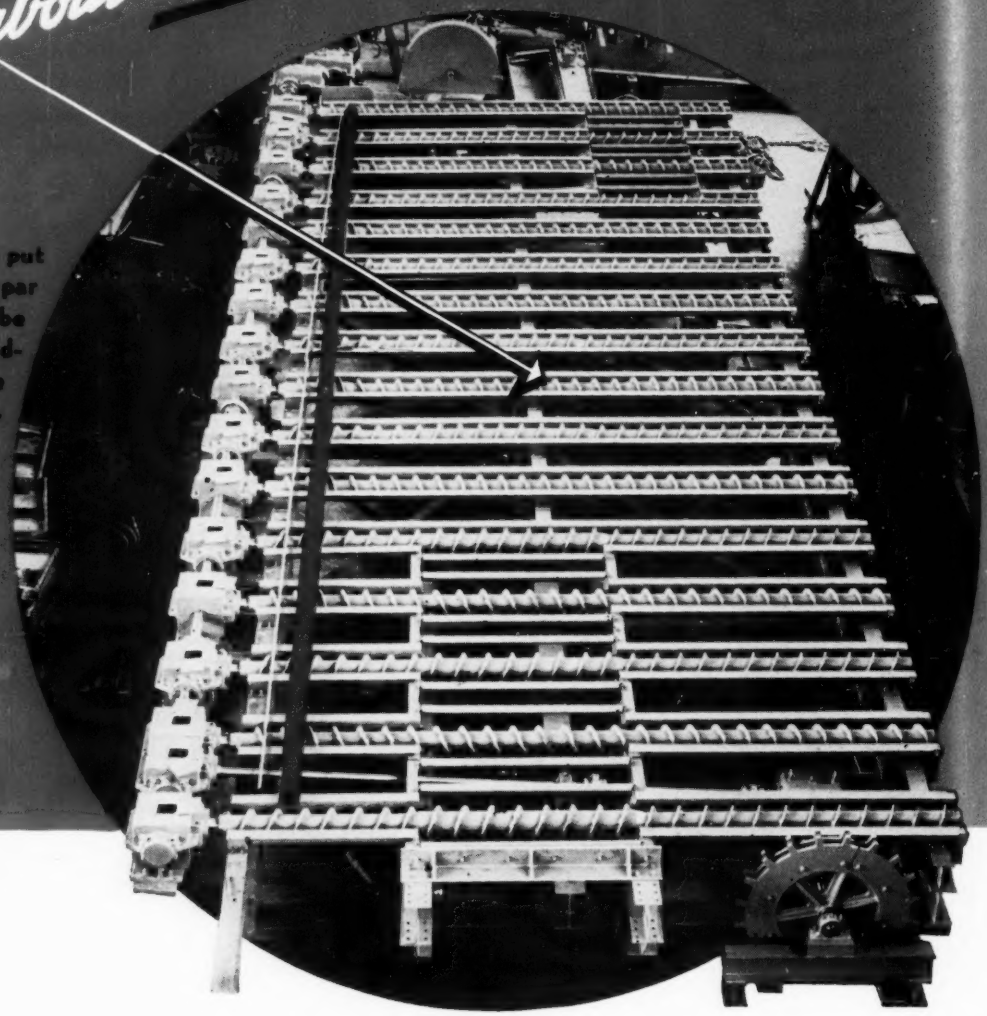

Patented Screw-Type Cooling Bed for Pipe and Tubing Has Multiple Advantages

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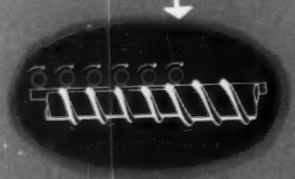
3. Complete control of tubes in motion is maintained. Transverse motion to either or both longitudinal directions of the bed is achieved by the design and motion of the screws. No auxiliary equipment is needed to feed tubes into saws for cropping. The same screws provide all directional control of motion.

4. Aetna-Standard's patented screw-type cooling beds are designed with a simplicity that not only speeds the operation, but reduces the maintenance requirements common to chain-type beds. Weigh the advantages and investigate this better method of cooling bed handling.



Here's the Basic Principle

Flanges of the turning screws roll tubes forward on tracks. Alternate turning directions of screw keep tube motion straight. Transverse motion is achieved by thickening shank of screws turning in desired direction so that tubes ride on and with the screws.

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Fundamentals of Forging Practice

Tool Construction and Maintenance by Welding

Applied X-Ray Metallography

STEEL

The Magazine of Metalworking and Metalproducing

VOL 122, NO. 26 — JUNE 28, 1948

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Crown Cork and Seal Company, Baltimore, Md., uses austenitic chromium-nickel stainless steel to assure the sanitation, durability and trouble-free performance of their CEMAC 28 unit. Easily cleaned, this stainless steel is highly resistant to foodstuffs, atmosphere, most organic and a great many inorganic chemicals, and to dyes and sterilizing solutions.

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June 28, 1948

Dangerous Precedent

There has been a widespread belief that mandatory allocation of steel would not be authorized by the 80th Congress—at least, not before the November election. Therefore, it is a rude shock to find that the Selective Service Act of 1948 carries a "sleeper" granting the President drastic mandatory allocation powers in peacetime.

In Section 18, under "Utilization of Industry," the President is empowered "to require all producers of steel in the United States to make available to individuals, firms . . . . having orders for steel products of steel materials required by the armed services such percentages of the steel production of such producers in equal proportion deemed necessary for the expeditious execution of orders for such products or materials. Compliance with such requirement shall be obligatory on all such producers of steel and such requirement shall take precedence over all orders and contracts theretofore placed with such producers."

This is mandatory allocation. It is doubtful whether it will accomplish anything beneficial that could not be achieved more effectively by voluntary allocation. However, the truly shocking portion of the "sleeper" is found in penalties for non-compliance.

"If any such producer of steel or the responsible head or heads thereof refuses to comply with such requirement," reads the amazing text, "the President . . . . is authorized to take immediate possession of the plant . . . . to insure compliance with such requirements." Any steel producer refusing to comply "shall be deemed guilty of a felony and upon conviction thereof shall be punished by imprisonment for not more than three years and a fine not exceeding $50,000."

Necessity for plant seizure during fighting wars has been so rare that one wonders why it is necessary in time of peace. In fact, one suspects that the sleeper—with its unneeded compulsory allocation and plant seizure provisions—was inserted in the draft bill surreptitiously and that many members of Congress who voted for the bill were unaware of its presence.

The preparedness program does not constitute an emergency justifying wartime measures. If the provisions of this "sleeper" are permitted to stand, future administrations will be encouraged to seek drastic powers on even flimsier pretexts. This invitation to govern by crisis should be removed at the earliest opportunity.

* * *

POLITICS AND INDUSTRY: Last week management in the iron, steel and metalworking industries was more than normally conscious of the role politics plays in relations between government and business. Industrial leaders were appraising the record of the 80th Congress and pondering the implications of planks in the Republican platform which bear upon business.

On both counts their findings were fairly encouraging. Before it adjourned on June 19, Congress—while leaving a considerable volume of important legislative work unfinished—had passed a surprisingly large number of bills which will have an important impact upon the future of the nation. From the standpoint of business, its major contributions were in laws which had the effect of reversing the antibusiness trend of certain New Deal legislation.

As for the GOP platform, it contains nothing that is definitely antagonistic to business and much which could provide industry with a

(OVER)

decidedly more encouraging environment than that in which it has operated during the past 15 years. Especially gratifying to businessmen is the prospect of working with an administration which promises to govern more by law than by personal whim and which, according to all previous party experience, is less likely to change its mind or to completely reverse its policies affecting business, than has been the case since 1933.

It has been said often that business can get along fairly well with any government administration providing the rules affecting business are made known clearly and are not changed too frequently or too abruptly. Today there is promise that this gratifying situation may be brought about in the not too distant future.

—p. 45

* * *

RECLAIMS OIL SLICK: A news item from Detroit recalls that 13 years ago Henry Ford initiated a project to skim oil from the surface of the Rouge river adjacent to the Ford Rouge plant and to reclaim it for subsequent use.

This practice is still being followed. Two pumps draw oil and water from the surface of the river into a separating tank. The water drains back into the river, while the oil goes into settling tanks, where sludge settles to the bottom. The sludge is used on parking lots and roads to lay dust. The oil is pumped to the open-hearth furnaces for fuel. Since last August 838,000 gallons of oil have been reclaimed, of which 464,000 gallons were available for fuel.

Oil slick is a serious problem on many industrial waters. The Ford plan looks like a simple and profitable solution. —p. 49

* * *

TONNAGE IN TRANSIT: Harrison Rogers, president of the Truck-Trailer Manufacturers' Association Inc., presents a timely argument for speedy transport. He does it through the medium of a hypothetical case.

Assume that a manufacturer uses a carload of steel daily. If it takes 14 days from the time a car leaves the mill until it arrives at the manufacturer's plant, then he requires—in addition to his normal inventory—14 carloads of steel to provide for steel in transit. But if the delivery time could be cut to one day through the use of highway transportation, 13 carloads of steel would be added to the available supply. Mr. Rogers goes on to say that the obvious benefits of rapid shipment have not materialized largely because of restrictive regulations on trucking by states in the "steel belt."

His point goes beyond railroad versus truck rivalry. It raises the question as to whether too much of our national output is tied up in transit and in other phases of distribution.

—p. 49

* * *

INDUSTRY SPREADS OUT: Since the end of the war, the automotive industry has constructed 34 major new manufacturing and assembly plants in various sections of the country. Today there are 113 assembly plants operating in 77 cities in 24 states.

This tendency to ship parts and subassemblies to strategically located assembly points is prompted chiefly by savings in costs, but there are other factors. One is the traffic and parking problem, coupled with other inconveniences, which obtains in congested metropolitan areas. One study indicates that plant efficiency suffers seriously when more than 25,000 employees are concentrated in a single plant.

The trend toward decentralization, now apparent in many industries, is wholesome in many respects. It makes for better living conditions for industrial personnel and for a sounder social and economic structure for the nation. —p. 60

* * *

WHERE INGENUITY PAYS: There seems to be no limit to the number and variety of situations in which the effective use of materials loading and conveying apparatus can assist in the full utilization of modern production equipment.

An excellent illustration is provided in the field of abrasive cleaning machines. With the advent of airless abrasive blasting in 1933, the problem of keeping a continuous and adequate supply of work flowing to and from the cleaning machines was intensified. Today that problem has been solved to a considerable extent by numerous clever arrangements whereby all sorts of handling devices are adapted to the service of cleaning equipment.

The infinite variety of the handling apparatus employed includes hooks, cradles, baskets and other accessories for all types of conveyors; multiple loading racks and tables; tote boxes; trucks; hoists; cranes and other units. Here is an attractive field for managerial ingenuity and resourcefulness. —p. 74

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

STEEL "DRAFTED"—Tired, sleepy congressmen in the final hours of the 80th session voted the President mandatory allocation powers over steel for military uses. The power (p. 45) is granted in a rider to the selective service act and observers doubt if many congressmen knew what they were voting for, for the prevailing sentiment of the legislators was against such emergency powers. The rider provides for seizure of plant, fine and imprisonment for any steel producers who do not comply. Steel consumers fear the action may increase their difficulties in obtaining steel for civilian products.

PRICING— What changes in pricing methods would be demanded by the FTC should the steel industry ask for a settlement of the commission's case against the industry? The FTC trial attorney thinks the terms would be less harsh than expected. One of the main requirements would be that each mill would have its own f.o.b. mill price and would sell at that price if requested to do so by the buyer (p. 46). Refractory brick manufacturers last week adopted an f.o.b. mill pricing system (p. 142).

POLITICS— All eyes and ears last week were turned toward Philadelphia where Republican leaders were whipping up a party platform as well as nominating a candidate. No one pays too much attention to political platforms, but the GOP offering (p. 45) at least promises business and industry a more favorable climate than it has had for the past 16 years.

RENEGOTIATION RETURNS— All contracts of the armed services in excess of $1000 are subject to renegotiation (p. 52). New regulations are being written and will be promulgated soon.

STOCKPILING—Purchases of strategic materials for the country's security stockpiles will be increased, even though such buying interferes with supplies for current civilian production needs. This is the policy (p. 51) set forth by the Munitions Board.

HIGH-COMPRESSION ENGINE— The Kettering high-compression automotive engine will be in production next year (p.59), but you probably won't be driving a car powered by the new unit for some years. Until a greater supply of high-octane gasoline becomes available, the high compression engine will be only an interesting gadget.

TRUCKERS' OPPORTUNITY— Builders of truck-trailers and the operators of large truck fleets are trying to capitalize on recent rail freight rate increases to obtain a substantial share of the rail freight business (p.49). Representatives stress the possibility of quicker deliveries. They ask that some of the present restrictions on the use of trucks on highway be lifted.

WAGE INCREASE MYTH— The fallacy that wages can be increased substantially without increasing prices has been exploded once again. Price advances have blossomed out all through the automotive industry (p. 60), the leader in granting third round wage boosts, and are starting to appear in other metalworking industries where wage adjustments have been made. Speculation as to what may be expected in steel wages and prices is current luncheon conversation.

SIGNS OF THE TIMES—Vacations, now getting underway in the metalworking industries on a large scale, will slow down output during the summer months, but are not likely to have much effect on long-term production (p. 47), due to the shortage of steel and other raw materials . . . . Estimates of machine tool needs for the new aircraft program have been scaled down sharply from the military's original—and ill considered—guess of 268,000 units (p. 51) . . . . Oil men, with plenty of dough and a big shortage of pipe, are trying to buy into the steel industry (p. 48) . . . . . Radio production is on the downgrade (p. 48) but television will take up much of the slack . . . Union newspapers may engage in political activity (p. 48), despite the Taft-Hartley Act ban on political spending, the Supreme Court has ruled.

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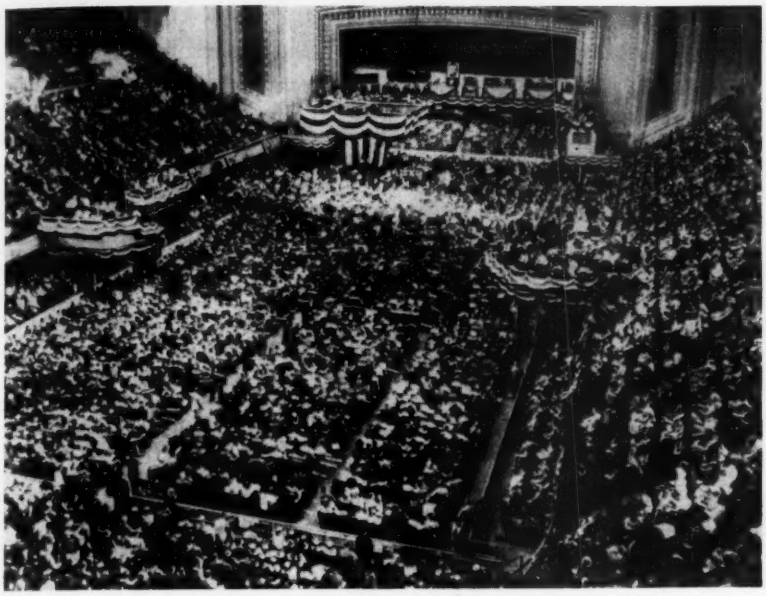


GOP POLICY MAKERS ENCOURAGE BUSINESS

Mandatory Controls for Steel

Rider to draft act giving President power to allocate steel for military needs comes as surprise to industry—and many congressmen. May increase difficulties of steel consumers

METALWORKING executives were startled last week by the news that the 80th Congress had granted the administration power of mandatory allocation of steel for military uses. The grant was contained in a rider to the Selective Service Act and was jammed through Congress in the closing hours of the session.

The action came as a distinct surprise to industry. Probably it also came as a surprise to many congressmen who voted for the bill. Consensus of prognosticators had been that no mandatory allocation powers would be granted at this time.

Title 1, Section 18 of the draft act empowers the President, through the secretary of defense, to require all producers of steel to make available to holders of defense orders the steel required to complete such orders.

"Compliance with such requirements shall be obligatory on all such producers of steel and such requirements shall take precedence over all orders and contracts theretofore placed with such producers."

Should any producer fail to comply, the President is authorized to seize his plant. The President is required to report to Congress on such allocations at 6-month intervals if they exceed 10 per cent of total production.

Could Disrupt Distribution — Steel consumers are apprehensive lest the mandatory allocation powers, if invoked on a large scale, make the obtaining of steel supplies more difficult.

Should the provision add to the present troubles of the rank and file steel consumers in obtaining steel, it would be an ironical joke on the House Small Business Committee whose chairman, Rep. Walter C. Ploeser (Rep., Mo.) fathered the amendment.

However, the impact of the provision will depend on the extent to which it is invoked. The House Small Business Committee estimates that the defense needs given priorities in the draft act will not exceed 5 per cent of total steel production. Defense needs, they say, would take precedence over nondefense needs under almost any plan of steel distribution.

The provision will encourage acceptance of military orders by manufacturers, who reportedly have not been too anxious for such work in the light of tightening of restrictions on allowable costs, re-enactment of renegotiation and good civilian business.

Effect on Voluntary Program — Office of Industry Co-operation officials last week expressed the belief that the mandatory allocation powers would not affect the voluntary allocation program now being carried forward under Public Law 395. The Steel Products Advisory Committee was informed that OIC would continue to function as in the past.

OIC announced that the advisory committee had approved allocations of 58,000 tons of steel for prefabricated houses and 21,000 tons for flue-connected floor and wall furnaces.

The committee is reviewing steel requirements for oil and gas producing industries and is studying possibilities of developing a program to assist small business in hardship cases.

Pendulum Swings

Promises of GOP platform augur better political atmosphere for industry and business

NATION'S INDUSTRY last week expected, and found, nothing to alarm or surprise it in the platform of the Republican party. Although the significant meaning was virtually polished and glossed away from some of the planks, the platform was nevertheless fashioned in a manner to convince metalworking executives that business need not play the villain on that stage. After being relegated for 16 years to such a part by hostile government officials, industry last week was glad to focus most of its attention on the anticipated pleasures of a more appealing role to be played for a friendlier group which all portents indicate will be running the show after the next election.

Basis for Optimism? — Judging from the platform, what basis for optimism has industry to go on? Metalworking leaders could point to the following planks:

1. Continuation of the European aid program with a pledge for firm, logical action in other areas of international affairs.

2. Pledge to combat inflation through government economy, encouragement of production, sound fiscal policies and reduction of the public debt.

3. Maintenance of a strong national defense program to be administered economically.

4. Maintenance of an adequate, privately operated, merchant marine.

5. Development of harbors and waterways and expansion of privately operated air transportation and communication systems.

6. Further reduction of taxation to encourage new industries.

7. Integration of federal-state taxing.

8. Encouragement of small business

through anti-monopoly action, elimination of unnecessary controls, protection against discrimination, correction of tax abuses and limitation of competition by governmental organizations.

9. Continuing study to improve labor-management legislation in the light of experience of changing conditions.

10. Continued conservation and stockpiling of strategic and critical raw materials as indispensable to the security of the United States.

11. Housing program to be supported and financed by private enterprise with federal assistance where needed.

12. Enforcement of the anti-communist laws.

13. Elimination of unnecessary or overlapping government bureaus.

14. Restoration to the states their historic rights to the tide and submerged lands, tributary waters, lakes and streams.

Basis for Pessimism? — Industry can't quarrel with much of this. The question, however, is: Will Republican legislative and administrative direction be forthcoming to transform into action the words of the platform? A negative answer could be found in the historical record of broken campaign promises by both parties. Also disturbing are signs, as evidenced in the last days of the 80th Congress, of differences in the ranks over foreign policy, housing and fiscal problems. Possibly, a Republican Congress could not implement those words set forth with such a show of unanimity last week. Another alarming factor is this: If a Republican administration is elected, it would inherit many situations—European aid and national rearmament for example—where basic policies affecting the nation profoundly have already been made and could not be changed later by the Republicans without dangerous upheavals.

The pendulum is swinging toward optimism, however, and because of one intangible and one tangible reason. They are, respectively, the psychological benefit anticipated from the sunnier climate of a GOP tenure and the fact that Congress now favors business for the first time in 18 years. Industry hopes that a situation will be gone forever where the government through its Temporary National Economic Control group could attack the steel industry before the war as "over-expanded" and now charge that the industry is "under-expanded." Gone, too, industry hopes, will be an administration which in 15 years can shift from NRA-sanction of pricing agreements to its current basing point attack.

Price Settlement May Be Moderate

Federal Trade Commission attorney says cease and desist order might be less harsh than expected. Suggests each company sell at f.o.b. mill prices when asked to do so

IF STEEL companies have been wondering what would happen if they were to ask the Federal Trade Commission now for settlement of its action against their multiple basing point pricing system, they now have at least one answer. The penalty wouldn't be as harsh as they may fear.

However, lightness of a penalty will not necessarily inspire steel producers to give up their fight, for they've been maintaining their present system is not illegal. Furthermore, they might regard any offer of only a light penalty now as an FTC lure to obtain their quick capitulation.

Nevertheless, they can ponder the

LYNN C. PAULSON

opinion expressed to STEEL by Lynn C. Paulson, the FTC trial attorney in the case, that at least now a cease and desist order would be a good deal less severe than they seem to think it might be. Mr. Paulson can voice only his own opinion, formed on evidence collected since hearings began last January, but after discussions with the commission he thinks he had good grounds for believing it would favorably consider his recommendations.

He would outlaw the present custom of charging only delivered prices for steel. Under his recommendation to the commission, each steel company would have its own f.o.b. mill prices and would sell at these mill prices when customers ask them to do so. Also, the American Iron & Steel Institute would be ordered to quit compiling and disseminating its freight rate books, on the ground that these are instruments for maintaining a delivered price system.

Could Meet Competitors' Prices—There would be no ban against quoting delivered prices, and there would be no ban on freight absorption or on a mill's selling outside its own freight territory. "In my opinion steel companies should be permitted freely to meet competitors' delivered prices. In fact, the steel companies should be encouraged to invade the territories of each other," Mr. Paulson declares.

"The steel complaint," he continues, "is directed at co-operation and collusion in establishment and maintenance of delivered prices; in other words, they are hanging on to selling exclusively at delivered prices. The basic thing in this complaint is the use of a limited number of base points and the steel companies' refusal to sell f.o.b. mill even when requested to do so. This position is prejudicial to the normal growth and development of the nation as a unit. There remains in the present multiple basing point system the same element of area discrimination that existed in the Pittsburgh Plus or single basing point system. And the two systems—single and multiple—have in common the sale of products exclusively at delivered prices with resultant denial to the consumer of the advantages of any other form of transportation than all-rail."

Information Exchange Permitted—On one important aspect of the case Mr. Paulson is open-minded. That is the arrangement under which steel producers exchange certain information.

"At the present juncture," Mr. Paulson says, "I would not recommend that the commission prohibit the American Iron & Steel Institute from being a medium for exchanging information on the description of products, as set forth in its manuals, and on the costs of extras. The evidence indicates there is co-operation in determining what should be considered an extra, and what should be the charge for that extra. If it is shown that there is a real need for such co-operation, and that the industry is not using classification of products and comparison of extra costs as an excuse for outright price fixing, my recommendations would be conditioned accordingly.

"Great care must be exercised in making a recommendation with regard to classification of products and co-operative action concerning extras,

because a blanket prohibition on what the industry appears to be doing in these fields might detract from the service which this industry renders in supplying the nation's steel needs, since the needs for steel today are so ramified and refined.

"I intend," says Mr. Paulson, "to give the industry every possible benefit of doubt, since I recognize that the production and sale of steel are very complicated matters, and hence feel that the commission must proceed carefully so as not to create confusion."

In correcting a statement attributed to him in STEEL, May 31, p. 32, Mr. Paulson points out he would place no restrictions on meeting competitors' delivered prices, as long as his basic conditions are met—namely, that there is a mill price at every mill, and that sellers are willing to sell f.o.b. mill when requested and that they refrain from getting together on freight rates for use in quoting delivered prices.

Pause for Vacations

SUMMER VACATIONS—to be on a mass basis this year to an extent never before envisaged—are not expected to affect materially the long-run production outlook of the metalworking industry.

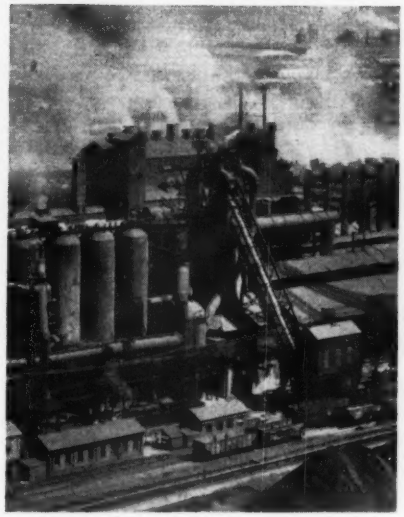
Most fabricating plants, hit by the steel shortage, are not on a full output basis anyway, and so the stockpiles accumulated during the shutdown will serve to permit full production for a short time after the holidays are over. In the steel industry itself, vacations in the iron and steel producing departments will be staggered so that output is maintained. Mass leaves will be granted only in finishing departments, but even here the dates will be staggered from plant to plant so as to assure at least partial production all the time.

Union leaders are encouraging workmen to take paid vacations instead of extra cash for vacation work because the taking of cash weakens their negotiation arguments for vacations. This factor, plus the administrative and operational headache involved in the staggered plan, has given impetus to programs for complete shutdowns.

In one area, Youngstown, for example, between 40,000 and 60,000 industrial workers, a new high, are currently taking from one to three weeks away from their jobs.

J & L Stack Sets Record

A NEW world's record for iron production is claimed by Jones & Laughlin Steel Corp. for its No. 3 blast furnace at Aliquippa Works. Before shutting down for a complete relining, this stack produced 5,823,951 tons of iron, which the company claims is two million tons more than produced by any other furnace between relinings.



RECORD BREAKER

No. 3 furnace operated almost continuously for 14 years 11 months and two days. During this entire campaign, the stack had no repairs other than a relining from the mantle to the top of the furnace in 1942. The furnace hearth and bosh were in service from June 13, 1933, until a few weeks ago when it was blown out.

In March, 1943, No. 3 stack established a monthly tonnage record by producing 48,505 tons, an average of 1565 tons a day.

Carnegie Lights New Stack

CARNEGIE-ILLINOIS Steel Corp. on June 20 lighted the second of two blast furnaces at its South Chicago plant and made the first cast on June 23. No. 12 furnace, which is identical with No. 11 lighted on April 22, has a daily capacity exceeding 1500 tons of iron.

Day after the stack was lighted, its operation was threatened temporarily by coke shortage when a fire occurred in the coal conveyor at the corporation's coke plant in Joliet, Ill. However, the fire was extinguished with less extensive damage than was at first anticipated.

Kaiser-Frazer Gets Steel

KAISER-FRAZER'S flat-rolled steel problems have been eased appreciably by establishment of quotas on tonnage from two large steel companies. One producer is shipping 1000 tons per month. The other will start shipping 166 tons per month in the third quarter. Additional steel supplies have been obtained through trades of pig iron from the Provo, Utah, blast furnace recently acquired by K-F. Some delay has been encountered in getting this unit into operation, mainly because of insufficient coal stocks—outgrowth of the coal strike—and difficulties with equipment which had deteriorated since the furnace was last operated. New slag cars, for example, although on order have not been received and at present slag is being run from the furnace directly into a ground pit. Production currently is about 400 tons per day. Most of this iron is being exchanged directly for flat-rolled steel, or goes into pool arrangements which ultimately result in more steel for K-F. Iron is being shipped to a West Coast steelmaker, for example, in return for which K-F receives specified amounts of assorted rolled material, lumped into a sort of "package."

Kaiser-Frazer recently sold its Chapman-Price mill at Indianapolis.

Fontana Expansion Starts

IN CALIFORNIA, Henry J. Kaiser last week announced an $18.5 million steel plant, just authorized by the Reconstruction Finance Corporation, will provide three main items of steel needed by western industries.

The Fontana expansions include:

1. Rolling facilities to produce hot steel sheets up to 78 inches wide and to a minimum of 14 gage thickness. The new mill is scheduled to produce 100,000 tons a year of both coils and flat sheets.

2. A new electric weld pipe plant will have 100,000 tons a year capacity for the production of pipes from 5 to 14 inches in diameter.

This will help alleviate the pipe shortage being experienced by petroleum companies and public utilities, since the new plant will supply "oil country goods."

3. The construction of a $3.5 million open hearth furnace on which work is under way.

This furnace will add a capacity of approximately 144,000 tons a year to Fontana—an increase of about 17 per cent to the southern California plant's steelmaking output. The goal is to complete the furnace this year.

Orders for equipment are being placed and work will be started immediately at Fontana, Kaiser Co. announced.

Sale of Consolidated Gets O.K.

THE SUPREME Court last week ended the government's fight to block Columbia Steel Co.'s purchase of

Consolidated Steel Corp. by denying the United States petition to rehear the case on which the high court June 7 rendered a decision approving the sale of the Los Angeles producer to U. S. Steel Corp.'s West Coast subsidiary.

Draft Impact Slight

Few to be called, but industry will feel drain due to lack of unemployed

NUMBER of men to be affected under the new draft law will be small compared to wartime calls but industry, nevertheless, will feel the impact.

Most of the youths facing the draft call are not skilled workers and cannot expect deferment or exemption as such. With industrial operations at high levels a draft of young men will mean industry will have to make replacements, and there is no large unemployment pool from which labor can be recruited. With the foreign aid program and an Air Force plane program gaining momentum there is little likelihood that industrial operations will decline.

Recognizing this, national and state employment services will suggest with additional emphasis the following: (1) Employment of marginal workers, including Negroes and handicapped; (2) fuller utilization of employees through job training, upgrading and job breakdown; and (3) recruitment of older people and women not now working and not seeking work.

In Cleveland, for instance, one-third of the unemployed are Negroes. Women, who comprised one-third of the work force there during the war, now account for 29 per cent. Job training, upgrading and job breakdown, employment services point out, make it possible to use some of the marginal workers who otherwise would not fit into employment forces.

At Cleveland approximately 2500 young men will be affected by the new draft law, which, incidentally, will not become effective until about the first of October at the earliest. Many draft-eligibles there have been attempting to avoid the draft by enlisting in the National Guard and other active drilling forces before the draft bill is signed by President Truman.

In the Pittsburgh district 4300 war veterans under 25 years of age and an additional 4500 in the 25 to 39 age group are still looking for work.

Kills Curb on Labor Press

UNION newspapers may engage in political activity despite the Taft-Hartley Act's ban against union political spending. This was the unanimous decision of the Supreme Court last week ruling in a test case inaugurated by CIO President Philip Murray. The high court sustained the Taft-Hartley non-communist affidavit provision by refusing to interfere with a lower court holding that it is constitutional.

It also upheld the law's requirement that unions must file financial statements with the government.

Oil Men Buy Into Steel

HEAVY DEMANDS for oil and the consequent high prices offered for it are making oil men determined to let nothing—not even steel pipe supplies—hinder their production of the black gold.

Accordingly, various negotiations continue to be conducted by oil men, principally from Texas and Oklahoma, to obtain supplies of casing and tubing. One Texas oil man, who claims he can provide the necessary supply of steel plate, has asked a fabricator to produce pipe for him, while a group of Texas oil men with multimillion dollar resources have attempted to interest a tubing manufacturer in building and operating a tube mill for them.

Just recently it was announced that a Texas oil group had bought the government-owned blast furnace at Chester, Pa., for approximately $300,000. The group, which it is said will be known as the Brown Engineering Co., proposes to exchange pig iron for pipe.

In another move to get a supply of pipe, Phillips Petroleum Co., Bartlesville, Okla., guaranteed a $4,125,000 bank loan which Kermac Corp. obtained to purchase Republic Supply Co., Houston, Tex., from Republic Steel Corp., Cleveland. The supply company is to obtain pipe from both Republic Steel Corp. and National Supply Co., Pittsburgh, under five-year agreements. Spokesmen for both Republic Steel and National Supply said that when they made the agreements they did not know any oil company was interested in the supply firm.

YOU CAN'T MOVE

One toy manufacturer most likely has a new conception of freedom.

The National Labor Relations Board has found that this manufacturer, Howard Rome, doing business as Rome Products Co., Akron, O., and Kenton Plastics Corp., Kenton, O., transferred his operations from Akron to Kenton, July 26, 1946, to avoid bargaining with the United Rubber Workers-CIO which on June 20, 1946, was certified as bargaining agent.

In a rare exercise of power the board ordered Mr. Rome to move his plant from Kenton back to Akron or pay union employees' expenses to move to Kenton to work for him, and also to reimburse 28 women employees for back wages lost since he moved his plant from Akron to Kenton.

Buyers' Market Returns

MANY SIGNS suggest that non-electric cooking ranges and stoves have joined radios, freezers, vacuum cleaners and electric irons in the change from the sellers' to the buyers' market, according to William A. Duvel, National Credit Office Inc., New York.

Unfilled orders as of Dec. 31, 1946, at 1,857,000 had dropped to 850,000 on March 31, 1948.

Television Gets the Ball

A DECLINE in production of AM radio receiving sets will be partly offset by a big jump in output of television sets this year, according to Max F. Balcom, president of the Radio Manufacturers' Association, in speaking at the group's recent annual convention in Chicago.

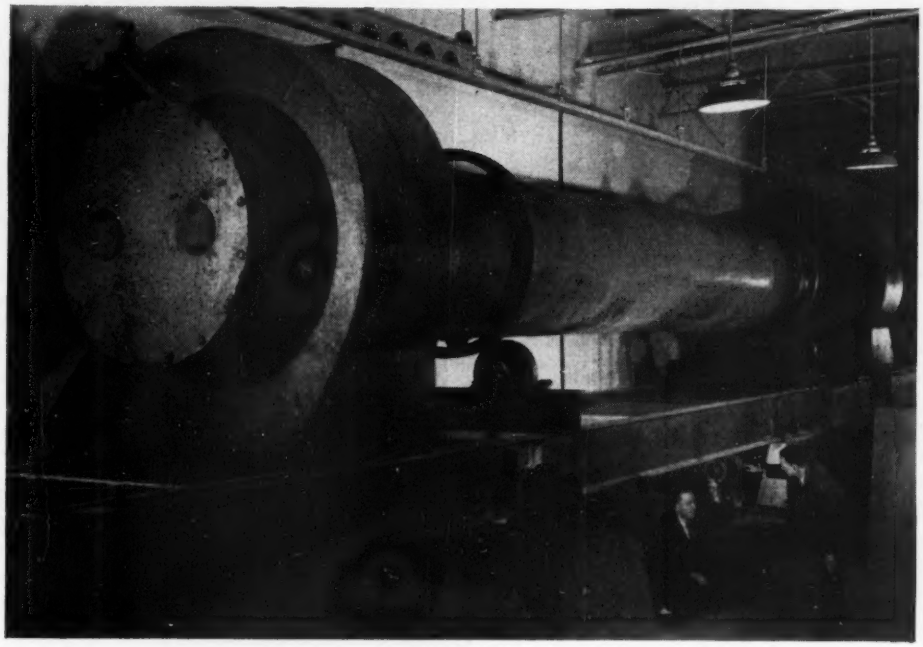
Approximately 15 million AM units will be turned out this year, 25 per cent less than last year. The industry made 20 million in 1947 and 16 million in 1946, with the result that the market is saturated. Television is the answer to the radio manufacturer's problem, said Mr. Balcom. Production of television receiving units is expected to reach 750,000 this year, far above the figure earlier anticipated, and the output may double this total in 1949.

Several producers already have announced plans to boost television set output to meet the shift in demand. Philco Corp., Philadelphia, plans to double its output, with production reaching an annual rate of 400,000 receivers by yearend; Stromberg-Carlson Co., Rochester, N. Y., will step up production of television sets to 2000 a month by the end of the year.

High Costs Brake Building

HIGH COSTS are beginning to act as brake on some lines of building

SAMPLE COOKER: Addition of a 72,000 pound rotary kiln 30 feet long and 39 inches diameter in research laboratories of Allis-Chalmers Mfg. Co., Milwaukee, completes the pilot mill and makes it possible to treat samples of ores and minerals by practically all known commercial processes. Kiln is being used with other pilot mill equipment for continuous tests on sintering and agglomerating iron ore concentrates and other operations



construction, according to Abbett Post, executive vice president, American Institute of Steel Construction.

"Reports from 15 districts, covering the country, indicate that investment builders in many areas are becoming cautious," Mr. Post also explained.

Truckers Hope To Gain

TRUCK-TRAILER manufacturers are looking hopefully to increased railroad freight rates to turn additional business to trucking companies, which in turn probably would become better customers for truck-trailers.

Asks Freer Use of Trucks

SHORTAGES OF STEEL, petroleum and other products now in heavy demand could be alleviated if distribution were speeded up, says Harrison Rogers, president, Truck - Trailer Manufacturers Association Inc., Washington. The trucking industry, he points out, could help this speed-up if trucks and truck-trailers were permitted the capacity use of existing highways.

To illustrate the point, Mr. Rogers says that if a manufacturer who uses a carload of steel a day finds that it takes 14 days from the time a car is loaded at the steel mill until the steel is in his plant, he requires, in addition to his normal inventory, 14 carloads of steel just to provide for the amount in transit. "But if delivery time," Mr. Rogers points out, "could be cut from 14 days to one day through the use of highway transportation instead of rail (and this is not an unrealistic assumption as many able traffic men know), 13 carloads of steel have been added to the available supply just in this one instance alone."

However, one of the reasons why this spectacular saving is not more frequently realized is that unnecessarily restrictive and conflicting size and weight limits are imposed on trucks by the very states that are in the heart of the "steel belt," Mr. Rogers declares. "The fact is that modern highways are about the same in every state in the 'steel belt,' and," he adds, "highway engineers know that modern highways will carry heavier gross loads without damage to the roadways if the loads are properly distributed."

Engineering opinion, says Mr. Rogers, holds that most of the present major highways are capable of accommodating trucks and trailers of the following dimensions and weights: Single vehicle length, 40 ft; tractor semitrailer combination, 60 ft; height, 13 ft 6 in.; width, 102 in. on prescribed highways; weight per axle, 18,000 lb, with minimum axle spacing of 42 in. and not more than four axles of 18,000 lb loads within any 24 ft.

Plugging for more freedom for the trucking industry, Mr. Rogers avers that "casting off the shackles can and will open the road to progress."

$450 Million for Roads

NEED for highway construction equipment, reinforcing steel and structurals for bridges should continue approximately unchanged for the next three years.

Just before adjourning recently, Congress passed a $450 million annual federal aid highway program for each of the years beginning July 1, 1949, and July 1, 1950. Previously, Congress made $500 million available for the fiscal year beginning July 1, 1948.

As in the past, states will be required to match the federal outlays dollar for dollar.

Skims Oil from River

THIRTEEN years ago Henry Ford made all the front pages with the news that he had initiated a project to skim oil from the surface of the Rouge river and boat slip adjoining the vast Rouge Plant and to reclaim it for subsequent use. It was no mere publicity stunt, and the project is still functioning. Since last August, for example, 838,000 gallons of oil have been so reclaimed. The rescue work is accomplished by two electric pumps which draw oil and water from the top surface of the stream and pump them into a separating tank where the water drains back to the river and the oil remains. The oil is "kicked" into settling tanks where the sludge settles out and the relatively pure liquid is pumped off into tank cars. The sludge is used on parking lots and roads to lay dust, while the oil is supplied to open-hearth furnaces for fuel. Out of the above amount, 464,000 gallons of oil were made available to the open-hearth department.

Steel in Detroit

Integrated industry has grown up around motordom, No. 1 customer, in past quarter century

IT HAS been 25 years practically to the day since the first steel was rolled at the Ecorse, Mich., plant of the newly-formed Michigan Steel Corp. on a 35-acre site downriver from Detroit. This culminated a dream of George R. Fink, one-time salesman for a Pennsylvania steel mill, who visioned a new, integrated steel industry in the immediate Detroit area with its large market for flat-rolled products. Today, that plant has grown to the Great Lakes Steel Corp., unit of National Steel Corp., and is still in process of expanding facilities for production of sheet and strip.

Charter was granted to Michigan Steel in September, 1922, to make steel sheets from bars supplied by other producers. Site for the new plant was almost on the spot where the Kelly converter, conceived in 1847, made the first bessemer steel in the U. S. in 1864. Michigan Steel rolled its first sheets on July 5, 1923, and shortly had over 1000 on the payroll.

Site First Big Problem — As Mr. Fink's plans for a completely integrated mill drew closer, a charter for Great Lakes Steel Corp. was granted in February, 1929, and additional funds were raised quickly. The important immediate problem was a suitable location. It had to be in the same district and afford sufficient space; it needed access to an abundant water supply for plant operation; and for transportation advantages it was highly desirable that the plant be at a water-edge. The search finally narrowed down to one location that had everything—except solid ground on which to support the enormous mass and weight of a steel plant and equipment. The location actually was a swamp, but surveys went ahead in rowboats and some 100,000 piles were driven 75 feet to bed rock for a foundation. Floor level was established at 15 feet above swamp level.

First facilities constructed were six open-hearth furnaces, four soaking pits, a blooming mill, bar mill, 34-inch hot strip mill, 10-inch and 14-inch merchant mills and auxiliary equipment. Production started Aug. 21, 1930. While construction was progressing, the corporation joined with National Steel which had a complete steel plant and other units producing ore, coal, pig iron, etc. Late in 1931, Great Lakes assumed operation of the Hanna Furnace Corp.'s blast furnaces on Zug Island in the Detroit river at River Rouge. A blast furnace had been built there in 1902 and a second one in 1909, both supplying merchant iron principally for foundries. Early in 1938 a third blast furnace was added and existing furnaces rebuilt and enlarged to furnish iron for the Great Lakes open hearths.

Subsequently operations were supplemented by a battery of 130 by-product coke ovens, a by-product plant, coal handling facilities and storage docks for iron ore, stone and coal. A new slag plant helped solve the problem of disposal of blast furnace slag. A 42-inch gas pipeline was laid to the plant to furnish fuel for open hearths, soaking pits, box annealing furnaces and slab heating units.

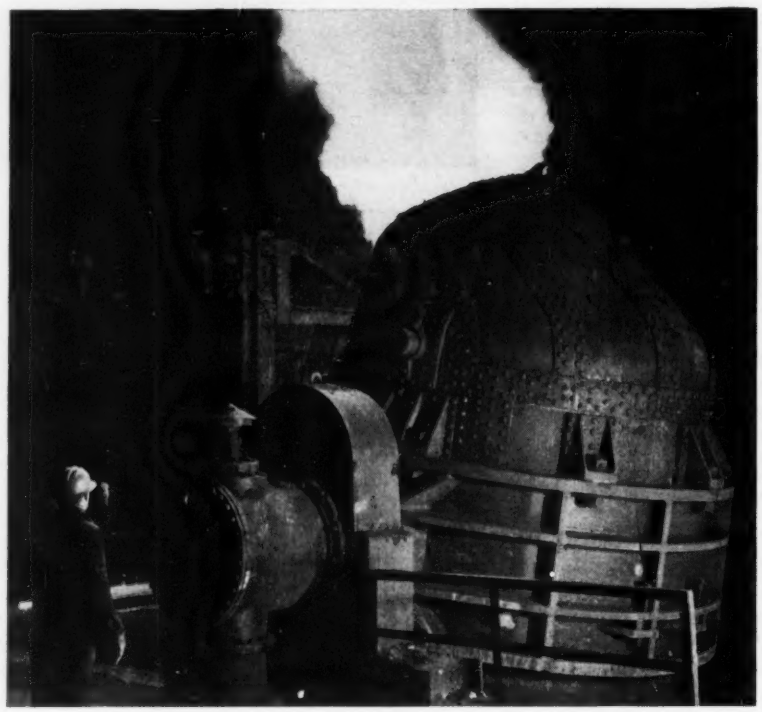
Eve of Depression—In passing, it is noteworthy that the project was conceived and constructed on the eve of a period of major economic readjustment, vindicating the judgment of the officers of the corporation who had faith in the country's future and of course giving considerable economic support to the immediate area from which employment was drawn.

The corporation showed steady growth and expansion. A 96-inch hot strip mill was erected. A 93-inch cold mill with supporting auxiliary equipment began operations in June, 1936. More open hearths were added, to provide one battery of 12, and a second separate group of four.

Late in 1941, Great Lakes Steel joined other industries in the conversion to war production. Sheet and strip steel gave way to ship plate, shell steel and other heavy products.

In 1945, the problem of reconverting to peacetime production went forward apace. Expansion of cold-rolled sheet production from 700,000 tons to 1,200,000 tons annually was projected, involving better than a 50 per cent addition to the cold mill and supporting facilities. A blast furnace was enlarged and relined in record time. Two bessemer converters of 25-ton capacity were installed to refine pig iron partially before transfer to open hearths, thus greatly speeding heat time in steel production.

Meanwhile an appreciable portion of the company's output has been low-alloy high-tensile steel of the N-A-X variety which permits appreciable weight saving at no sacrifice of strength on many consumer products. Corollary products rolled in smaller volume include automobile spring and bumper steel, special rolled sections, cold-drawn bars and enameling sheet.



Open house for employees, their families and the general public was held by Great Lakes Steel Corp. on Thursday and Friday, June 24 and 25. Visitors were shown the most important stages of steelmaking and rolling on specially conducted 1½-hour tours from 10 a.m. to 7 p.m. Trips through the plants wound up at an exhibition hall where the company's products were on display and where souvenir booklets were presented to guests. Over 20,000 attended

Munitions Board's Domain Enlarged

PREPAREDNESS planning of the National Military Establishment as it applies to all industrial matters, including procurement, production and distribution for the departments comprising the establishment, has been delegated by Secretary of Defense James Forrestal to the Munitions Board.

By his directive, Secretary Forrestal established a new administrative organization for the board, eliminating the executive committee and naming a director of the staff. The board now consists of Thomas J. Hargrave, chairman; Gordon Gray, assistant secretary of the Army; W. John Kenney, undersecretary of the Navy; Arthur S. Barrows, undersecretary of the Air Force. Stuart W. Cramer is deputy chairman. Director of the staff, empowered to name, with approval of the secretaries of the military departments, three military directors, is Lt. Gen. Leroy Lutes.

To the Munitions Board now falls 21 specific duties and powers ranging from the exercise of the Secretary of Defense and the military departments' duties with regard to stockpiling of strategic and critical materials through standardization of common-use items. It will formulate the overall policies for "translating all end item requirements of the departments into basic elements such as manpower, raw materials, facilities and services." It will determine priorities of the various segments of the military procurement programs. And in the exercise of its duty to prepare plans governing the military aspects of industrial mobilization, it will be responsible for "preparation of mobilization requirements, procedures and policies which will cover such activities as allocation of industrial facilities, apportionment of scarce materials, allocation of skilled civilian personnel, letting of war contracts and other allocation of industrial services essential to prompt development of the war potential."

Stockpiling Squeeze On

INDUSTRY appears headed for more raw materials shortages under the changed policy of the Munitions Board with respect to stockpiling. The board's chairman, testifying before the House Appropriations Committee, indicated the board will step up its purchases of strategic materials even if supplies are not adequate for civilian industrial needs.

"We feel," Mr. Hargrave said, "that industry has had more than two years to reconvert and the time has arrived when we must think more strongly in terms of national security in the event of a future war."

After his testimony the committee approved a $300 million appropriation for purchase of metals, minerals, fibers and rubber for emergency use and at the same time authorized the Bureau of Federal Supply to let long-term contracts for an additional $300 million. Mr. Hargrave's board had requested $360 million and $375 million for these purposes.

To date purchases and contracts of material for stockpiling total $206 million in addition to $125 million of strategic materials taken over from federal agencies' wartime stocks. These sources have offered the board another $191 million of the critical materials.

If the Munitions Board is to complete its stockpiling program on schedule it will have to acquire about $2732 million worth of materials over the next three years.

As the source of part of its requirements, Mr. Hargrave said he hoped the board could purchase a larger amount from Latin America and could acquire some materials from the European participants in the aid program. The long-term contracts, he indicated, could be used as a means of developing new sources of materials so as to minimize the impact of the board's purchases on civilian industry.

USAF Tool Needs Shrink

FLURRY which was caused in machine tool circles when the government erroneously advised that its tool needs for the expanded air force might aggregate 268,000 units over the next five years had subsided by last week. A program of this size would have been equal to about one-third of the industry's output during the entire war period.

It is understood that this figure was hurriedly made by Air Force planners who had incomplete knowledge of the manufacturing capabilities of wartime aircraft and components suppliers and it vastly overstated the actual needs.

Best estimate now available from the National Machine Tool Builders' Association is that contractors' and subcontractors' machine tool needs for expansion of military materiel production probably will aggregate not more than $100 million over the next 12 months. (This total would be below the average monthly shipments of the industry during the height of the expansion-for-war period 1942-1943.)

Some ordering of new tools to produce aircraft parts is currently being done. But tooling up for mass production has not gotten into full swing, one major reason being that postwar-developed planes of the jet variety will require machines and techniques not yet available. Problems in machining the types of heat-resistant materials essential in jet engines have not been completely solved, although progress is being made along this line.

New Tool Ordering Declines

ALTHOUGH a considerable volume of machine tool ordering is in prospect as the result of the expanding preparedness program, the industry meanwhile is plugging along at the unexciting pace set by normal domestic requirements. Ordering last month was down about 10 per cent from the previous month, and with shipments up slightly and cancellations also up, a dent was made in the unfilled order backlogs of the industry.

Foreign orders, bottled up until funds can be made available through Economic Co-operation Administration to the participating governments and thence to prospective foreign buyers, are holding about unchanged.

Debut for Straightening Machine

A NEW straightening machine will be demonstrated June 28 by Sutton Engineering Co., Bellefonte, Pa., in connection with celebration of its 30th anniversary.

Company reports the machine will make a complete change from 5½-in. to 14⅜ in. diameter seamless tubing in less than five minutes. The range of this device, to be built for all sizes and ranges, is from 5½ o.d. to 18½ o.d. Company will also demonstrate a 7-roll guideless machine of the same design, straightening ⅜ in. cold-drawn bars.

Columbia Halts Foundry Output

IN A MOVE to make available all steel possible for conversion into rolled products, Columbia Steel Co., San Francisco, a U. S. Steel subsidiary, will discontinue foundry operations at its Torrance plant near Los Angeles. All other steel-producing units will continue to function. Present foundry commitments will be completed before suspension at Torrance, expected to occur in 60 to 90 days.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

Renegotiation of military contracts again authorized but its use may be delayed in view of handicap services might face in trying to place orders

RENEGOTIATION of military procurement contracts is here again after a brief interlude. First, Congress, in Public Law 547, wrote a "Renegotiation Act of 1948" to apply to procurement under the $3,198,000,000 70-group Air Force program. Now by an amendment to the Second Deficiency Appropriation Act, it has extended that renegotiation act to all contracts of the three armed services.

Under Public Law 547, all contracts of the armed services in excess of $1000, and all subcontracts thereunder in excess of $1000, with certain exceptions, are to contain the following article:

"This contract is subject to the Renegotiation Act of 1948 and the contractor hereby agrees to insert a like article in all contracts or purchase orders to make or furnish any article or to perform all or any part of the work required for the performance of this contract."

The secretary of defense is given some discretion in deciding when to grant exemptions from renegotiation. Excepting for such exemptions, he is directed to renegotiate when in his opinion excessive profits are earned under any contract or subcontract. He is to renegotiate by agreement with the contractor or subcontractor. Failing to obtain agreement, he is to use Subsection (c) (2) of the Renegotiation Act of Feb. 25, 1944, as amended, to determine the amount of excessive profits. Credit for federal income and excess profits taxes is to be determined in accordance with Section 3806 of the Internal Revenue Code. Renegotiation is to be of a blanket character, applying to the aggregate amounts received under all military contracts in a year or fiscal year. To avoid duplication of inspection and audit, the secretary of defense may call upon the Bureau of Internal Revenue for any needed assistance. The act provides that contractors or subcontractors aggrieved by demands they regard as unwarranted may apply to the Tax Court of the United States for a redetermination of the amount they must refund.

Few Exemptions Seen—While Public Law 547 provides that the secretary of defense "in his discretion" may exempt any contractor or subcontractor from renegotiation, and may exempt certain classes of contractors and types of contracts, it is doubtful whether such exemptions will be granted on any substantial scale, since it is clearly the will of Congress that renegotiation be employed generally.

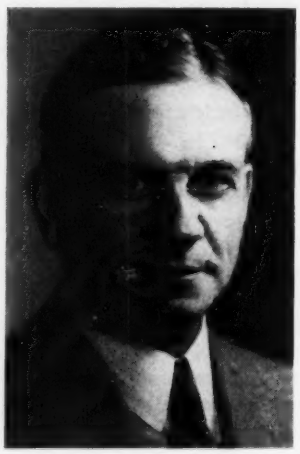
Exempted from renegotiation, as in World War II, are the products of mines, oil or gas wells, or other mineral or natural deposit, or timber, which have not been processed or treated beyond the first form or state suitable for industrial use.

An interservice committee in the office of the secretary now is writing new renegotiation regulations which will be promulgated as soon after July 1 as possible. Some delay may be encountered due to problems incident to utilizing renegotiation in time of peace, and particularly under conditions when many industries are unable to produce in quantities sufficient to take care of current civilian and export demands and might not be interested in booking military orders containing the renegotiation clause.

Steel Official Joins ECA

Clarence B. Randall, vice president, operations, Inland Steel Co., Chicago, has been named principal steel consultant to Langbourne M. Williams Jr., director of the Economic Co-operation Administration's Industry Division at Paris.

Mr. Randall, who will assume his new duties in Paris soon, also has been president of an Inland subsidiary, Inland Lime & Stone Co.



CLARENCE B. RANDALL

Other recent appointments in ECA include: James J. Wadsworth, Genesee, N. Y., special assistant to Paul G. Hoffman, administrator for Economic Co-operation; William Westlake, Chicago, assistant director of ECA information division in charge of the domestic program; and Arthur G. Syran, Washington, director of ECA transportation division. Mr. Wadsworth, who for the past two years has been director of the governmental affairs department of the Air Transport Association of America, will serve as liaison with Congress and in other capacities as representative of Administrator Hoffman.

Stop Watches Banned

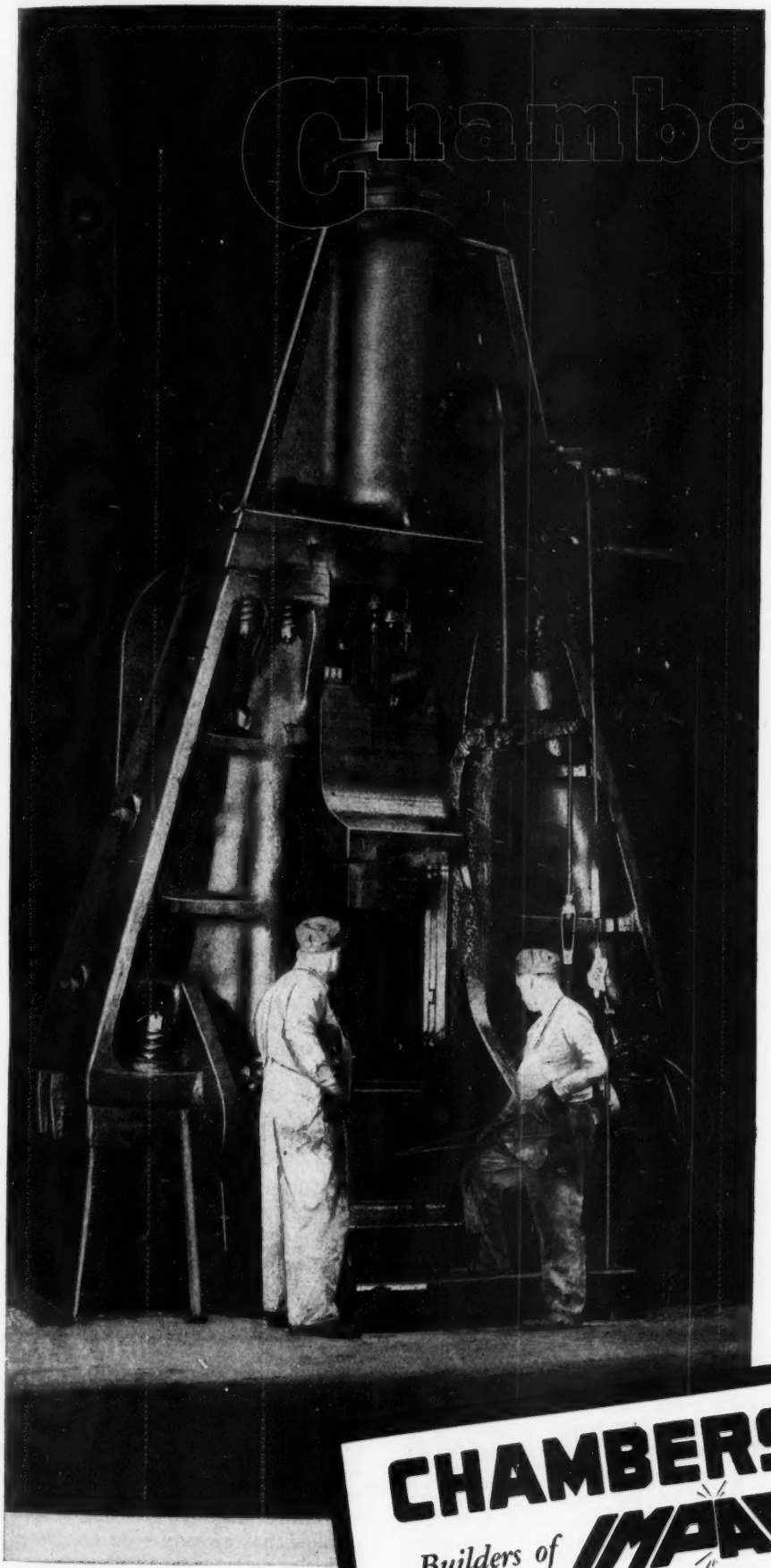
Lack of labor union vigilance resulted in enactment of the Navy's appropriation bill for fiscal 1948 without the customary ban on the use of stop watches in conducting job efficiency studies. This oversight was not repeated in connection with the Navy appropriation bill for fiscal 1949. The bill was amended on the Senate floor by Sen. Leverett Saltonstall (Rep., Mass.), with acceptance by the House conference committee.

Petroleum Probe Delayed

Because of the last-minute pressures on Congress, and to allow for the national convention, the House Interstate and Foreign Commerce Committee postponed resumption of its further petroleum investigations from June 16 to June 29. The committee proposes to sit as long during the summer as it thinks desirable to uncover any obstacles to a plentiful supply of petroleum products over the coming winter. The committee hopes, as a result of its hearings, to formulate a recommended national petroleum policy.

Would Develop Dirigibles

By an act cleared by Congress to the White House on June 15, the Maritime Commission is authorized and directed to study, and plan for, experimental lighter-than-air rigid airships. It is to report results of this preliminary study to the 81st Congress as early next year as convenient. On the basis of the report, Congress then will consider appropriating a fund to launch a real pro-



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Builders of **IMPACT** *Machinery*

gram of airship development.

The act is the result of a one-man crusade by Rear Adm. Charles E. Rosendahl who, in charge of the naval airship station at Lakehurst, N. J., for many years was an ardent advocate of airships of the dirigible type. Admiral Rosendahl thinks dirigibles have an important place in transporting troops, weapons and supplies without incurring the hazards to which ocean-borne ships are subjected. The admiral, who was decorated and retired with the permanent rank of vice admiral in 1946, now resides at Flag Point, Toms River, N. J., and is an occasional visitor in Washington.

Work on Census Pushed

Preliminary reports from the 1947 Census of Manufactures are expected to be available for some industry groups within the next few months. However, a substantial flow of 1947 manufacturing statistics will not begin until the latter part of this year. Meanwhile, the Bureau of the Census is appealing to manufacturers to expedite their reports so the canvass can be completed.

As in the past, final industry and state reports will be published as separate bulletins and subsequently incorporated in bound volumes. The bureau plans three comprehensive bound volumes on the 1947 census: A summary volume, an industry volume, and an area volume. Also there will be a special publication on truck transportation, and if funds permit, a new commodity volume.

Deadline for completing work on the 1947 Census of Manufactures is June 30, 1949, at which time the appropriation for this undertaking expires. At that time all reports for the industrial canvass either will have been published or will be in press for early issuance.

Factory Hirings Level Off

Manufacturing industries in April continued, as in March, to hire workers at the rate of 40 per 1000 employees on the pay roll. It was the lowest April rate for any year since the prewar period. Only six of the 19 major industry groups reported some increase in hires during the month, with most of the remaining groups indicating small declines chiefly as a result of materials shortages and seasonal reductions in activity.

Except for the automobile industry, all of the hard-goods industry groups indicated stable or reduced hires during April. In the automotive industry, assembly plants sharply reduced layoffs and increased hires, reflecting an improved flow of materials. In contrast, parts producers, including automotive electrical equipment and nonferrous foundries, reduced their workforce because of decreased orders. This may be due to the stockpiling of parts by assembly plants during periods of low automobile production earlier in the year.

The effects of materials shortages were shown in relatively high layoff rates in several iron and steel fabri-

THOMAS C. BLAISDELL JR.

Has been named assistant secretary of commerce. He had been director of the Office of International Trade, U. S. Department of Commerce. NEA photo

cating and machinery industries. Radio manufacturers, however, reported some easing of the seasonal curtailment of recent months; layoffs dropped substantially and hires increased somewhat.

With the opening of the Great Lakes to shipping, the hiring rate in the iron mines rose sharply to 56 per 1000 employees. Lead and zinc mines, too, reported expanded operations. Quits also rose in the metal mining industries, however, as some miners returned to the farm for the crop season.

Greece To Get American Steel

Department of Commerce has announced arrangements have been completed with the steel industry for early export to Greece of approximately 17,000 tons of various steel products. Similar arrangements also were made for shipment of 121 tons to Iceland. Shipments to both countries are within the export quotas set by the department.

Most of the steel to be shipped under these government-sponsored programs will consist of flat-rolled products, but will include merchant and reinforcing bars, wire rods, and other miscellaneous items.

The steel for Greece is required for the general rehabilitation of the economy of that country. Iceland will receive hoop steel for barrels for herring, export of which represents a major factor in the Icelandic economy.

The Federal Bureau of Supply, Washington, will act as procurement agent for the Greek steel. Private agents will handle shipments to Iceland.

It is expected that, as in the past, the individual companies involved will undertake to supply the types and quantities of steel needed, and that no formal priorities will be issued.

Inventories Steady

Manufacturing and trade inventories at the end of April were virtually unchanged from their March levels, according to the Office of Business Economics, Department of Commerce.

This marked a cessation of the sizable inventory accumulation which occurred during the first quarter as sales lagged while production continued on a plateau. In April, there was an increase in retail and wholesale sales.

Retail-store stocks in April before adjustment for seasonality showed an increase of $46 million from March. However, on a seasonally adjusted basis no major line of trade showed a change of over 1 per cent from the preceding month.

Pipe To Go to Iran

Export licenses for 11,650 tons of heavy oil-line pipe have been granted to the Anglo-Iranian Oil Co. The pipe will be used to construct a pipeline in Iran from the oil field at Agha Jari to the port of Bandar Maschur on the Persian Gulf. The new line will have a daily capacity of 100,000 barrels of crude oil. Of this amount, a minimum of 40,000 barrels has been contracted for delivery to the U. S., and a considerable additional quantity may also become available for U. S. purchase.

Office of International Trade officials emphasized that the construction of the line between Agha Jari and Bandar Maschur—a distance of only 48 miles—represents the most efficient use of this quantity of pipe. The oil wells have already been drilled, and the necessary dock installations and storage facilities have already been constructed. The 11,650 tons of heavy pipe, which constitutes the entire steel requirement of this pipeline, has already been fabricated and is at dockside awaiting shipment. The construction of this line will make available more oil for the quantity of steel involved than any other pending project. The pipeline will be completed by June, 1949.

France Hopes Price Cuts Can Quiet Labor

PARIS, FRANCE

AGITATION for price reductions in certain classes of manufactured goods, particularly those entering into the cost of living, is growing in France. Leading labor unions, while accusing the government of having failed in its promise to bring down the cost of food and household goods by June 1, are demanding a 20 per cent wage boost.

In response to the clamor, the government will put into effect, upon approval by the cabinet, measures to lower prices of steel, clothing and other cost-of-living items. As now planned, the price of steel products would be reduced by from 5 to 10 per cent, which in turn would reduce the cost of manufacturing items such as agricultural machinery, automobiles, containers, etc., and would result in 2 to 5 per cent lower prices on them.

Relief for steel producers, who feel the reductions will place a heavy burden on them since their raw materials costs are still mounting, may be provided through possible cancellation of the present steel allocation system. Production gains made recently by the industry, it is felt, justify an end to controlled distribution.

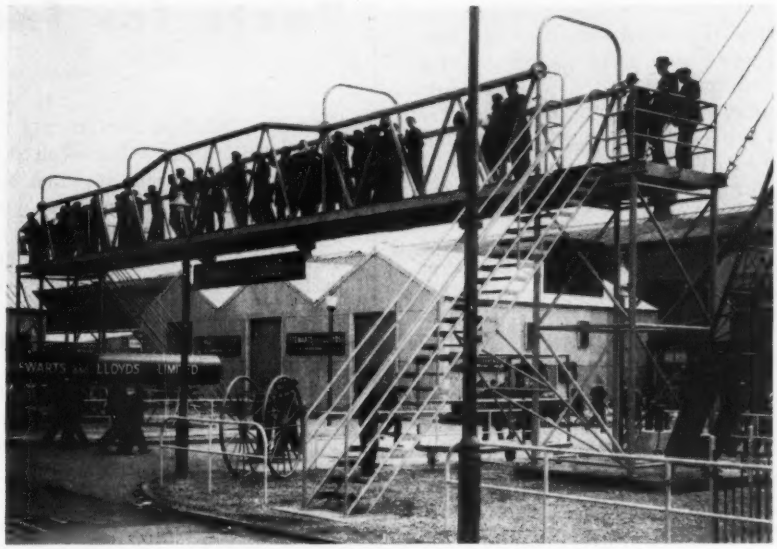
Prewar Levels Exceeded—Overall output of France's heavy industry is now at the rate of 125 per cent of the prewar level. Production has advanced to 87 per cent of the Monnet Plan goal for 1948. April's steel production rose to 640,000 tons, against 616,000 in March, and was 121 per cent of the 1938 base. Output of hot-rolled steel products, at 464,000 tons in April, was 135 per cent of the 1938 average. Pig iron tonnage in April was 554,000, 110 per cent of the prewar base level. Production of coal in that month amounted to 111 per cent of 1938 output, but including allocations from the Saar, coal imports declined sharply, due to the miners' strike in the U. S. Auto and truck production set a new postwar record in April, total turnout being 17,199 units, comprised of 8472 passenger cars and 8727 commercial vehicles. Based on 1938 production, the index for truck output rose to 223 per cent.

Encouragement that has been felt over the steel industry's recent gains is tempered by knowledge that raw materials, notably coal and coke, have imposed a production ceiling, which is rapidly being approached. Although the coal situation has improved markedly, it is not yet stabilized and to some extent is dependent upon outside influences (such as the American miners' strike).

The industry continues to improve its position through commercial agreements. A mutual contract with Great Britain, for example, authorizes French works to export semifinished steel products to England at the initial rate of 40,000 tons a year, with provision of a sliding scale so that when French production totals 10 million tons a year, exports will rise to 200,000 tons.

In addition to this agreement, others of a special nature have been negotiated. One, between Societe Metallurgique de Normandie with British manufacturers of steel plant equipment, provides for supply of necessary equipment for reconstruction of the French firm in return for which the company, when back in production, will again furnish semifinished steel to its prewar British customers.

Recent technical developments in metallurgy and use of oxygen in steelmaking and pig iron production are not being overlooked by the French in their efforts to increase production. A new company, La Metallurgie Francaise Moderne Metafram, has been formed to exploit new metallurgical processes and has one of its objects development of powder metallurgy. Active in the manufacture of oxygen and its expanded use in the Societe L'Air Liquide.



BRIDGE THE GAP: Britain's drive to bridge the gap from industrial obsolescence to a position of world leadership was illustrated by new products and applications at the British Industries Fair in Birmingham. Shown at the fair was this unusual tubular bridge designed by Stewarts & Lloyds Ltd.

Germany

In the Russian zone the Maximilians Huette will blow in an additional blast furnace. This company's output of iron in 1947 was 45,000 metric tons. In Bizonia allocation of steel for the current half of the year has been fixed at 1,200,000 metric tons, with the transportation industry scheduled to receive 189,000 tons, the mining industry 175,000 tons, agriculture and the food industries 104,000 tons, and 72,000 tons for export. Earmarked for re-equipping industry is 51,000 tons.

Belgium-Luxemburg

Increased iron and steel output in Belgium and Luxemburg is making more products available for export and helping shorten delivery dates. Now visualized is allocation of 50 to 60 per cent of the countries' output for export, which would throw an extra 700,000 tons into the world market. France is not yet regarded as a dangerous competitor for export business, except in semifinished steel, which is not a major Belgo-Luxemburgian export item.

Exports from the Union established a postwar record in March of 259,000 metric tons, with principal recipients being the Netherlands, Switzerland, Great Britain and Sweden. Total exports for first quarter were 721,930

tons, compared with 429,284 in the like period of 1947.

Plans for development of the Belgian iron and steel industry cover construction of five new blast furnaces and a number of steel furnaces with capacity of from 90 to 120 tons. The ARBED firm in Luxemburg is installing a new plant for cleaning and concentrating iron ore. New rolling mills for the Dudelange works have been ordered from the U. S. but are not expected to be in operation before 1950.

Italy

Production of iron and steel in Italy has been fluctuating from month to month in relation to supply of scrap, with average monthly output of steel having been about 155,000 metric tons. The situation is improving, however, partly as the result of a recent agreement with France for supply of scrap from the French colonies. With deliveries now being made under this agreement it is expected average monthly steel output between April and October will range between 180,000 and 200,000 tons.

Sweden

First quarter Swedish production of pig iron was 267,200 tons, compared with 273,000 tons in the similar 1947 period. Steel ingot output, however, improved, 313,500 tons having been produced, compared with 310,000 tons in the first quarter of 1947.

Meetings . . .

June 28-30, American Foundrymen's Association: Fifth annual chapter chairman conference, Hotel Stevens, Chicago. Society secretary-treasurer is William W. Maloney, 222 W. Adams St., Chicago.

June 28-July 1, American Electroplaters' Society: Annual convention and industrial finishing exposition, Ambassador Hotel, Atlantic City, N. J. Society headquarters are at 473 York Rd., Jenkintown, Pa.

July 16-24, American Road Builders' Association: 1948 convention and road show, Soldier Field, Chicago. Association headquarters are in the International Bldg., Washington.

July 21-23, American Society of Civil Engineers: Summer convention, Olympic Hotel, Seattle.

July 26-27, Institute of Scrap Iron & Steel Inc.: Midyear meeting, Ambassador Hotel, Atlantic City, N. J. Institute executive vice president is E. C. Barringer, Dupont Circle Bldg., Washington.

Aug. 10-13, First Western Packaging Exposition and Conference: San Francisco Civic Auditorium, San Francisco.

Aug. 24-27, American Institute of Electrical Engineers: Pacific general meeting, Spokane, Wash. Institute headquarters are at 33 W. 39th St., New York.

Sept. 7-20, Department of State: First inter-American conference on conservation of renewable natural resources, Denver.

Sept. 13-17, Instrument Society of America: Third instrument conference and exhibit, Convention Hall, Philadelphia. Society headquarters are at 1117 Wolfendale St., Pittsburgh.

Facts for Industry . . .

(As reported by government agencies)

Truck Trailers—Shipments of truck trailers in 1947 amounted to 55,372 units valued at $138 million. Production during the year was 53,096 units. Shipments, in units, were down 24 per cent, and in dollars were off 9 per cent from 1946. Production was 30 per cent under the previous year. The only major types to show increases in shipments last year were tank trailers, low bed heavy haulers and off-highway trailers. *Census Bureau, Commerce Dept.*

Gray Iron Castings—Shipments of gray iron castings at 1,051,083 short tons in April were 10 per cent below the March level, when the highest shipments were made since the start of the series. Shipments to the trade of 584,969 tons accounted for 56 per cent of the total, the remainder being for producers' own use. All classes of castings showed declines. Miscellaneous types were off 6 per cent to 722,000 tons; molds for heavy steel ingots were 29 per cent less at 123,000 tons; chilled iron railroad car wheels shipments totaled 65,000 tons, a drop of 14 per cent; cast iron pressure pipe and fittings shipments declined to 91,000 tons from 101,000 tons in March; and cast iron soil pipe and fittings shipments totaled 50,000 tons from 53,000 tons in the previous month. *Census Bureau, Commerce Dept.*

Nonferrous Castings — Lower level of shipments was reported for the following types of nonferrous castings in April: Copper and copper-base alloy castings shipments at 89 million lb were 8 per cent under the March level; the 38 million lb of aluminum and aluminum-base alloy castings shipped was also 8 per cent less than in the previous month; magnesium and alloy castings, with shipments of 673,000 lb, were 4 per cent under the March level; April shipments of zinc and zinc-base alloy castings amounted to 39 million lb, 6 per cent under the previous month's total; and lead and lead-base alloy castings shipments, amounting to 1.2 million lb, were 18 per cent below the March level. *Census Bureau, Commerce Dept.*

Natural Gasoline — Production of natural gasoline and allied products decreased in April to 490,410,000 gal, but demand for these products did not keep pace with production with the result 20,978,000 gal were added to stocks. *Bureau of Mines, Interior Dept.*

Canning Closures — Production of commercial metal and plastic caps in March was 1012 million units, 17 per cent above the February total. Of the March output 783 million were metal caps. Output of milk bottle closures was 1673 million units, compared with 1404 in February. March production of crowns was 32.5 million gross, 16 per cent above the February total and only 1 per cent short of the postwar peak. Output of metal screw bands was 424 thousand gross, compared with 327 thousand gross in February, and production of metal lids for these closures rose to 1.3 million gross from .9 million gross in February. Consumption of tin mill products for metal closures amounted to 588 thousand base boxes compared to 516 thousand in February. *Census Bureau, Commerce Dept.*

Iron Ore—Production of iron ore was 12 per cent higher in March than in February, at 3,019,381 gross tons. Shipments from mines were 1,706,874 tons. Lake Superior mines produced 1,478,481 tons, 17 per cent more than in February. Production in the southeastern states (Alabama, Georgia and Virginia) was the highest ever recorded at 699,790 gross tons; northeastern mines (New Jersey, New York and Pennsylvania) also established production records, output being up 20 per cent over February. *Bureau of Mines, Interior Dept.*

Wrought Magnesium — Shipments of magnesium wrought products in April were 516,000 lb, an increase of 12 per cent over March shipments, and were the highest since March, 1947. *Census Bureau, Commerce Dept.*

West Coast Industrial Trends Mixed

WEST COAST Chamber of Commerce personnel can view with alarm or point with pride to certain developments which may indicate future industrial trends in that area.

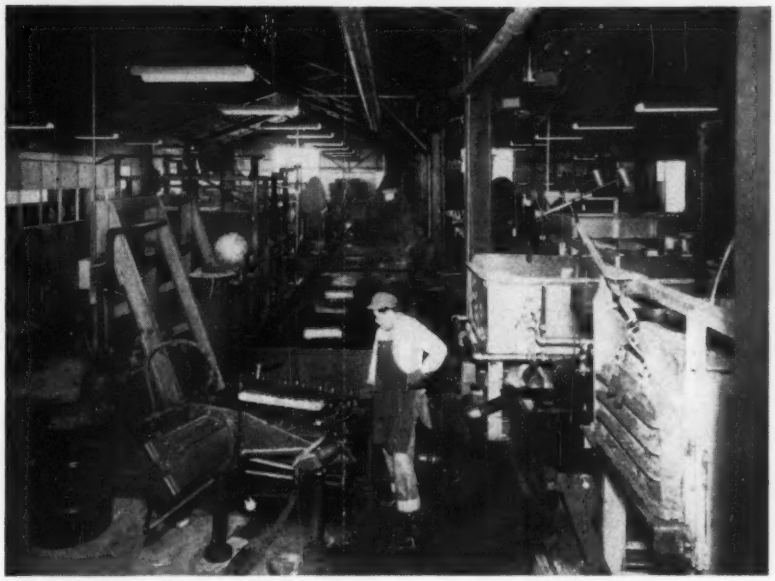
On the debit side was California's shrinking employment lists which showed further contraction in May, largely as a result of declines in the shipbuilding, iron and steel, automobile and aircraft industries. These and other durable goods industries had total employment of 257,600 factory workers in May, nearly 20,000 fewer than in May, 1947. Compared with April, the decline amounted to 3900. These losses were offset by an increase of 1000 production workers in nondurable goods industries, the gains, however, reflecting seasonal spurts in fish canning and beet sugar processing. As a result, total factory employment in all California industries showed a net contraction of 2900 for May as compared with April. Total number of production workers last month was 456,000, compared with 467,800 in May a year ago.

Expanding at Declining Rate — Also cause for some misgivings could be the declining rate in industrial expansions on the Coast where in one area, Los Angeles, the bloom appears to be fading from the mushroom. In the first five months of this year Los Angeles county new industrial investments totaled $37,426,500, compared with investments of $52,100,500 for the corresponding period a year ago. Thus far in 1948 the county reports 77 new factories, with a total investment value of $8,786,000, and 146 expansions worth $28,640,500. For the first five months of 1947 91 new factories were established with a total investment of $33,662,000 and 163 existing plants were expanded, calling for an additional investment of $18,438,500.

On the other side of the picture, J. Lester Perry, president of Columbia Steel Co., San Francisco, said he was "hopeful and optimistic for the future" of West Coast industry. Speaking at the annual convention of the Pacific Coast Electrical Association, he foresaw a gradually increasing supply of steel for western consumers as a result of expanding ingot-producing and finishing facilities. He pointed out that in the last eight years the growth of steel capacity of the Far West has been greater, percentagewise, than in any other region of the United States. Present steel-producing capacity west of the Rockies, Mr. Perry said, is capable of providing about 2,700,000 net tons of finished steel annually, as compared with 900,000 tons before the war.

Exhibition at San Francisco — Sponsors of the Bay Area Industrial Exposition at San Francisco's Civic Auditorium July 2-9 heartily endorse Mr. Perry's optimism and declare that their show graphically demonstrates the bright industrial future for the area. More than 250 manufacturers and distributors will show publicly for the first time new developments in hundreds of products produced or assembled in the 12 counties which make up the San Francisco Bay region.

As an indication that the West Coast, and particularly the San Francisco area, is far from falling off in its industrial pace, the figures show that factory employment is 41 per cent above prewar levels and that this region's population has jumped 43 per cent to a total of 3,063,000 since 1939.



OPENS NEW SERVICE DIVISION: United States Spring & Bumper Co., Los Angeles, has opened a new service division to make replacement parts for the automotive industry, with special attention given to special and overload springs. In photo, foreground shows leaf for automotive spring being machine-formed prior to being placed in oil quenching tank and then to draw furnace for tempering; center shows oil quenching tanks; at left is panel room where gas-fired furnaces are pyrometer controlled

Food Machinery and Westvaco Plan Merger

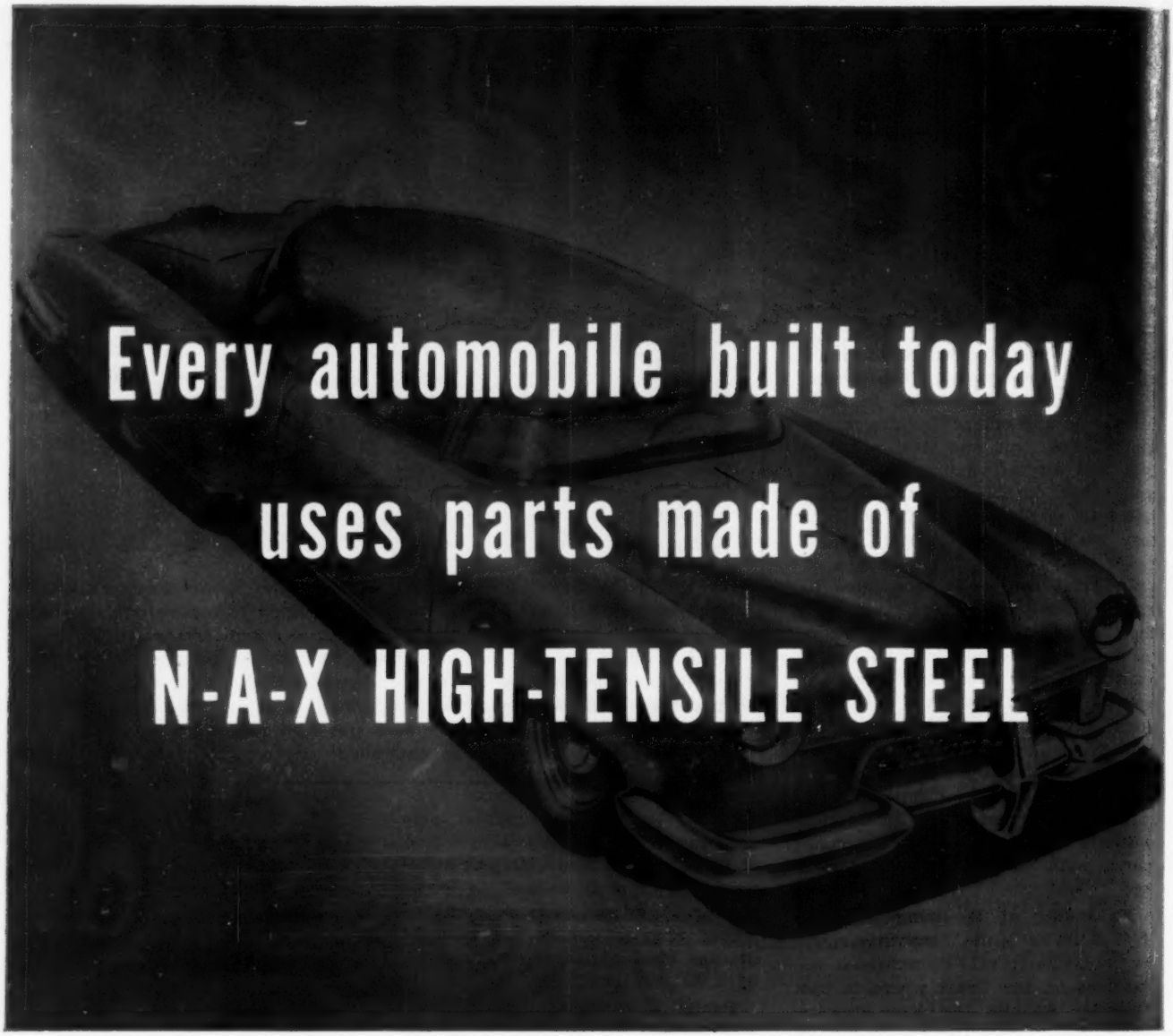
Food Machinery Corp., San Jose, Calif., and Westvaco Chemical Corp., New York, have reached an agreement for merger, and the proposed plan will be submitted early in July to stockholders of both companies for action.

Food Machinery, as the surviving company, will change its name to Food Machinery & Chemical Corp. The business of Westvaco will be operated under the direction of its present management as the Westvaco Chemical Division of the company, and Westvaco's interest will be represented on the board of directors.

Business and products of the two companies are expected to be complementary. Food Machinery manufactures food and chemical processing equipment, while Westvaco produces organic and inorganic chemicals and other raw materials. The merger is also expected to provide a needed diversification of products.

Merger agreement will provide for an exchange of 1¼ shares of Food Machinery's common stock for each share of Westvaco's common and for the exchange on a share-for-share basis of Westvaco's $3.75 cumulative preferred for a new preferred stock in the new organization. Rights and preferences of Food Machinery's 3¼ per cent cumulative convertible preferred stock will remain the same.

Paul L. Davies is president of Food Machinery and Westvaco president is William B. Thom.



Since 1940, when Great Lakes Steel pioneered the application of high-tensile, low-alloy steel to cold-stamped automobile bumpers, there has been a growing trend to N-A-X HIGH-TENSILE STEEL in the automobile industry.

Today, every car manufacturer is using the inherent better properties of N-A-X HIGH-TENSILE STEEL for some part of his automobile.

Bumpers and grilles – hoods and fenders–body panels and deck lids – frames and bracings – wheels and hub caps represent a few of many applications of N-A-X HIGH-TENSILE STEEL to the modern car.

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By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

New Ford models and tremendous promotion with which they are launched pose job for Chevrolet and Plymouth. New designs will be ready before "selling" is needed

DETROIT

FROM THE upper reaches of the General Motors Building, top officials of the corporation doubtless are taking more than occasional glances out their windows at the large billboard directly across Grand Boulevard which proclaims the "'49 Ford is here now" and in front of which one of the new Ford jobs revolves slowly. Particularly those concerned with the destinies of Chevrolet must be thinking ahead to the tough competition which will come when automobiles once more have to be "sold." They must smile wryly in the realization that much of the aggressive competition now being planned at the Rouge comes from the nimble brains of those who were formerly in the ranks of General Motors.

The promotion fanfare accompanying the new Fords probably has never been equalled in automotive history. If there is anyone in Detroit who does not know of the new models he must be deaf, dumb and blind. However, at the same time, all the thousands who saw them and read about them and even reverently touched them know they cannot buy one for possibly two years because there are 1,500,000 orders on the books already. Ford's immediate problem, it would seem, is to keep the appetites of these would-be buyers whetted until production catches up with demand.

Competitors Busy — Meanwhile, Chevrolet and Plymouth, you can be sure, are not going to be standing still. They too have all the orders they could wish for, yet at the same time must realize the Ford of today is considerably ahead of their designs, stylewise at least, and is in production. What are they going to do about it?

Well, for one thing they have had a chance to look the field over pretty carefully, even before the Fords came along. Unmistakable trends are everywhere in the direction of lower roof and floor levels, wider bodies and seats, somewhat higher horsepower-to-weight ratio, blending of fenders into body lines, improved heating and ventilation, etc. Cadillac and the Olds Futuramic incorporate most of these advances. Logically they will be extended to Chevrolet, Pontiac and Buick as soon as tooling is completed and the present model production projections can be covered in manufacturing schedules.

Reports have been current around Detroit that Buick would be first this fall; in fact, originally it was planned to use the new Cadillac-Olds body type on the Buick Roadmaster when the 1948 models were set in motion early this year. Something jammed on the deal. Possibly General Manager H. H. Curtice at Flint had ideas which did not fit in exactly with the proposal. Possibly Fisher Body was not able to furnish the new bodies in sufficient quantities to meet Buick's requirements. At any rate the old bodies were continued on all models with minor embellishments to make them look a little different.

This fall or early winter, the new bodies in the so-called "A" and "B" series will be ready for Buick, Chevrolet, Pontiac and Oldsmobile series which were not changed earlier this year. Present information indicates they will follow closely the lines of the "C" bodies now used by Cadillac-Olds.

Automobile Production

Passenger Cars and Trucks— U. S. and Canada

	1948	1947
January	422,324	366,205
February	399,460	393,636
March	519,126	443,588
April	461,348	445,137
May	355,400*	404,191
June		421,466
July		400,944
August		364,478
September		444,501
October		461,536
November		417,493
December		492,109
12 mos.		5,055,284

* Preliminary.

Estimates for week ended:

	1948	1947
June 5	75,607	98,499
June 12	109,831	97,943
June 19	107,700	102,545
June 26	102,000	103,203

Estimates by Ward's Automotive Reports

High-Compression Engine

The Kettering high-compression engine will be in production next year, according to a recent statement by its progenitor, Charles F. Kettering, retired head of General Motors research. He indicated the new V-8 power plant would be smaller than present engines, a little lighter and somewhat higher in cost. Although the basic design will permit stepping up compression ratio to the 12.5 - 1 optimum determined in test engines, the first step will be nowhere near this far, possibly only 8-1, against the present average of around 7 - 1. A stumbling block in the path toward speedier adaptation of the new engine to production is the apparent apathy of oil companies to organizing facilities for refining and distribution of the necessary high-octane fuels. Without them, the high-compression engine is just an interesting gadget. However, GM is going ahead with production plans, gambling that by the time the engine is ready the oil companies will have made their move.

The yarn is being told around Detroit of a test car, equipped with the Kettering engine, which made the trip from Detroit to New Orleans without a single stop at a gasoline station. Explanation, of course, is that stops for refueling had to be made at airports, where 100-octane fuel was available.

December for Chrysler?

Chrysler Divisions have been sitting back saying nothing about new models, content to sell everything they could turn out and to keep a watchful eye on what competitors were doing. Of course, there were tentative designs being drawn up, which received one jolt when the new Hudson styling was disclosed, leading to revisions in Chrysler planning. The pace was leisurely, and tool and die shops could not figure the pitch for a long time. Finally a dribbling of Chrysler work came out this spring and the guess was made that a changeover might be possible this fall. Changes and delays have post-

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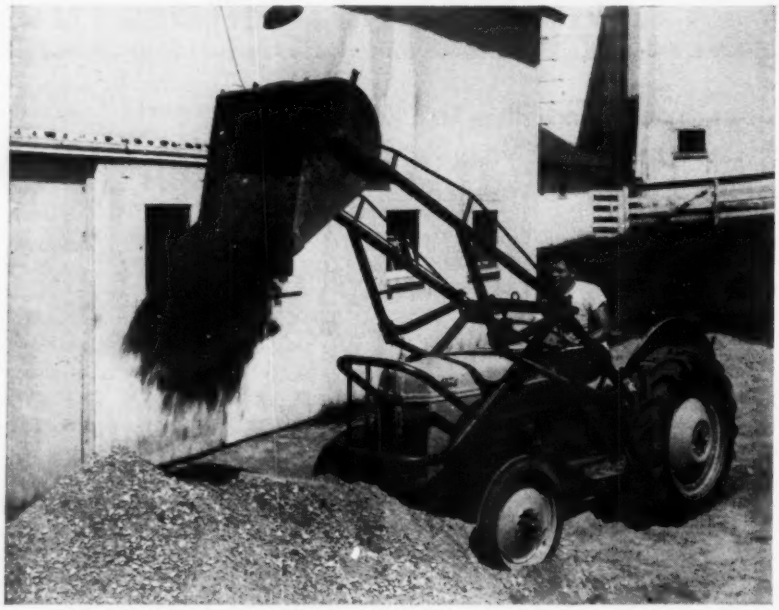


FARMER'S AID: This heavy duty loader, which can be hooked to a tractor easily, may serve as a power shovel, crane or hoist by merely changing attachments. The device was among the special duty tools for farmers recently unveiled by Dearborn Motors Corp., marketing organization for the Ford tractor and Dearborn farm equipment

poned this date and it now looks like December for anything new from the Chrysler - Dodge - DeSoto - Plymouth family.

The combination of fluid coupling and semiautomatic transmission which Chrysler has pioneered could well be extended to Plymouth in the next model series, and it is considered a good possibility that Chrysler may have something new to spring in the way of an infinitely variable transmission for its top-price cars.

Prices Going Up

Like June, the automotive price line has busted out all over, with General Motors passenger car divisions about the only hold-out, and cost experts there are burning up their slipsticks to see where they stand in the light of the most recent wage increase. Chrysler divisions raised all prices last week around $100 average. Most of the independents have done likewise. Ford may have to make further boosts to cover its latest wage increase offer, since prices announced at the time of introduction of 1949 models did not reflect any further additional wage cost.

Ford's proposal to the UAW-CIO, suggesting an increase of 14 cents an hour on all rates over $1.50 and 11 cents an hour on all under, was a straight-from-the-shoulder proposition, deliberately throwing away all the "room for horse trading" usually accompanying preliminary negotiations. The increase would become effective the day the union signs the contract, whether it is before, on or after July 15, expiration date of the present contract. This places the union in the embarrassing position of losing $1 per day per man for each day of delay in agreement.

John S. Bugas, vice president and director of industrial relations for Ford, explained that the company had to retreat from its initial position in which a hold-the-line policy was enunciated because of the actions of principal competitors in granting wage increases, despite the fact average Ford rates were at least 6 cents an hour higher before the raises.

The Rouge producer is in a rather rough position this year because of the substantial loss of production involved in the complete model changeover. Estimates indicate a loss of possibly 150,000 passenger cars which it will be difficult to make up over the balance of the year. Planning calls for output of around 525,000 of the 1949 Ford models by year-end and to achieve this, weekly assemblies must be moved up well beyond the 20,000 level which at this stage looks like an ambitious undertaking.

Many New Plants

Since the end of the war, the automotive industry has erected a total of 34 major new manufacturing and assembly plants in various sections of the country, bringing to 113 the total number of assembly plants now operating, in 77 cities of 24 states. The list is slated to grow in the next few years. It does not involve any serious suspension of operations in principal manufacturing plants in the Detroit and eastern Michigan area, but rather the shipment of parts and subassemblies to remote assembly points instead of the shipment of finished cars.

Cost saving is the chief reason for the apparent decentralization. New plants are laid out for a more efficient flow of materials and are fitted with improved machinery and equipment. Another economy comes in freight. One manufacturer, for example, reports a 57 per cent increase in freight charges since June, 1946, adding $20 million to operating costs. A further factor is the traffic and parking problem in metropolitan areas which make the operation of a large plant increasingly difficult. One study has indicated plant efficiency suffers seriously when more than about 25,000 employees are concentrated in a single plant. Finally, there is the availability of labor to consider. Already some plants in Detroit have abandoned the idea of going to two shifts because it was simply not possible to enroll sufficient help. Lengthening the present shifts to 9 hours or resuming Saturday operations has proved more economical, despite the overtime pay involved.

General Motors' newest assembly plant, at Atlanta, was opened formally June 15 and will supply Buick-Olds-Pontiac models to an eight-state southeastern area. Another similar operation at Framingham, Mass., is just getting into production, while a third postwar assembly unit at Wilmington, Del., is going full tilt.

K-F Receives Portsmouth Steel

Although Kaiser-Frazer Corp. has disposed of its 200,000 share equity in Portsmouth Steel Corp., it is continuing to receive its allotment of slabs, cold-rolled sheet, wire products, sheet bar and other semifinished items from the mill under terms of the original contract. Maximum monthly shipments of slabs and cold-rolled sheets obtainable is 1700 tons, sheet running up to 52-inch width. Certain portions of the contract run until 1951.

K-F, incidentally, built its 250,000th car last Saturday, just two years after the start of production at Willow Run.

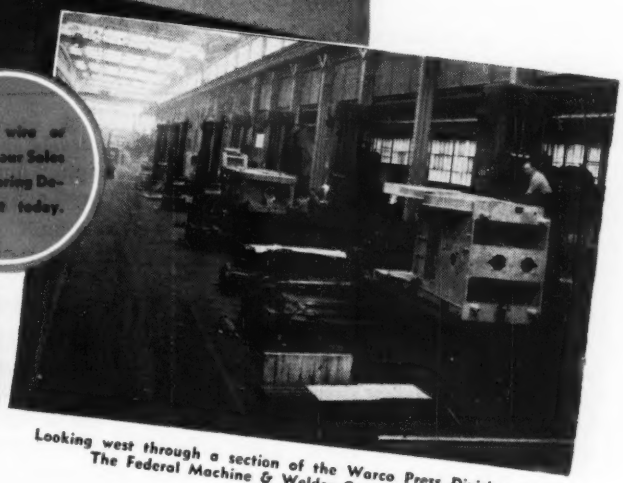
Check Federal

SPECIALISTS IN EQUIPMENT PROBLEMS

Partial view of the Engineering Department at The Federal Machine & Welder Company's Plant No. 3

Center bay (looking west) in The Federal Machine & Welder Company's Plant No. 2.

Write, wire or phone our Sales Engineering Department today.



Looking west through a section of the Warco Press Division of The Federal Machine & Welder Company's Plant No. 3

Federal plant facilities are recognized throughout the industry as being the finest in the country for the fabrication, welding, machining and assembly for all types of light or heavy equipment, either to your specifications or designed by Federal engineers.

THE FEDERAL MACHINE & WELDER CO.

DEPT. 468, WARREN, OHIO

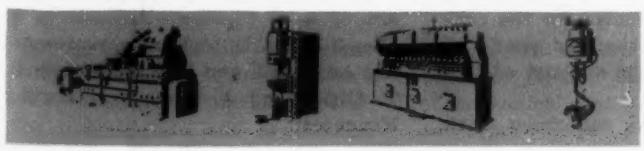
Federal WELDERS

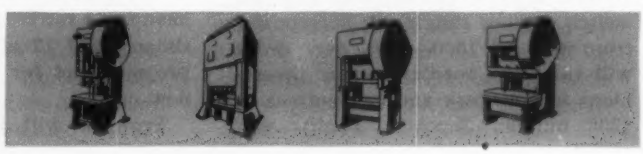
Resistance Welders for Every Application

All Types of Special Machinery

Warco PRESSES

From 50-ton OBI to 2000-ton Double Action





J & L Boosts Capacity for Iron Output

INSTALLATION of 13 hot metal cars, each with a capacity for 200 tons of molten metal, is expected to increase the iron-producing potential by 75,000 net tons per year at the Aliquippa, Pa., works of Jones & Laughlin Steel Corp.

J & L is converting 100 per cent to the use of these "thermos bottles" for transporting molten iron from Aliquippa's five blast furnaces to the bessemers where it is converted into steel. Dismantling of the old-style, 25-ton, open top ladle cars will begin this month. Also to be eliminated will be two huge mixers formerly used as reservoirs where metal was held in a molten state until it was reladled and poured into the converters. In the new system, this step will be unnecessary as the molten iron from the blast furnaces will be tapped into the hot metal cars, and carried directly to the bessemers.

Pioneered Use of Large Cars—J & L is a pioneer in the use of large mixer-type hot metal cars and used the first one ever built in the United States, in 1916, at its Pittsburgh works. M. H. Treadwell Co., Pittsburgh, designed the 13 new ones which are approximately 53 feet long from center to center of the couplings and which have a height of about 13 ft. Total weight, including fire brick lining and a capacity load of iron, is 368 tons for each car. The cars can pour a maximum of seven tons of iron per minute.

To permit greater facility in reladling iron from the hot metal cars for pouring into the bessemers, two new reladling pits have been constructed. New railroad trackage has been laid to carry the additional weight of the hot metal cars.

FORD SELLS GAGE DIVISION: Ford sells Johansson Gage Division to Brown & Sharpe Mfg. Co., Providence, R. I. Carl F. Unruh, acting director of purchasing at Ford, signs the sales contract while Arnold K. Brown of the machine tool firm looks on

Southern Pacific To Buy 95 New Diesel-electrics

Southern Pacific Railroad is planning purchase of 95 new diesel-electric freight locomotives at a cost of approximately $25 million.

Thirty of the new engines will be 6000 hp mainline freight locomotives and the remainder will be diesel switch engines ranging in horsepower from 600 to 1500. This new order will raise the road's postwar investment in new cars and locomotives to $208 million. Southern Pacific will have 334 diesels in service when all the new engines on order or authorized have been delivered.

Detroit Broach Names Sales Representative

Detroit Broach Co., Detroit, manufacturer of broaches and broach tooling, has appointed Coats-Moore Supply Co., 804 S. Main St., Memphis, Tenn., as its representative. Coats-Moore will cover Tennessee; Cobert, Franklin, Lauderdale, Lawrence and Limestone counties in Alabama; and the section north of and including Hinds, Lauderdale, Newton, Rankin, Scott and Warren counties in Mississippi.

Engineering Group Backs 14 Research Projects

Fourteen research projects will be sponsored by the Engineering Foundation for the year beginning in October, 1948, Dr. A. B. Kinzel, chairman of the board, has announced. Grants have been recommended for the continuation of 12 of the past year's 17 projects, and for the support of two new ones.

Projects will be concerned with studies in hydraulics, metal cutting, alloys of iron, properties of gases and gas mixtures, riveted and bolted structural joints, reinforced concrete, welding and properties of metals at different temperatures.

Research is carried on in a number of universities and some engineering plants in co-operation with the foundation's engineering founder societies: American Society of Civil Engineers, American Institute of Mining & Metallurgical Engineers, American Society of Mechanical Engineers and the American Institute of Electrical Engineers.

Kennecott Forms South African Exploration Firm

Kennecott Copper Corp. and Anglo-Transvaal Consolidated Investment Co., Johannesburg, South Africa, have formed a new company with capitalization of $4 million to be known as Kennecott-Anglovall Exploration Co. Ltd.

The new company's board will consist of A. S. Hersov, chairman, S. S. Menell and J. D. McKenzie, representing Anglovall, and E. T. Stannard, C. T. Ulrich and A. Gray, representing Kennecott.

Briefs . . . .

Paragraph mentions of developments of interest and significance within the metalworking industry

Arens Controls Inc., Chicago, manufacturer of flexible and rigid remote control equipment, has appointed Eynon-Dakin Co., Detroit, as its exclusive representative in Michigan. Arens plans a sales expansion program for the Detroit area.

—o—

Production Die Cast Co., Grand Rapids, Mich., has recently expanded its die casting division to facilitate die casting several new high strength aluminum base alloys. Step was taken to supplement the firm's current facilities for the production of zinc base alloy die castings having the hardware-type finish.

—o—

Foxboro Co., Foxboro, Mass., announces that its 1948 training courses in the theory, application, operation and maintenance of industrial instruments will be of two weeks' duration during July, August, October, November and December.

—o—

J. A. Shomer Co., Cleveland, has been appointed distributor for all power transmission equipment manufactured by Boston Gear Works, Dodge Mfg. Co. and U. S. Electric Motor Co. Irving Marshall, formerly of Boston Gear Works, and John Haller, formerly of Boston Gear Works and W. M. Pattison Supply Co., offer specialized service on this equipment.

—o—

American Institute of Steel Construction, New York, has presented awards totaling $500 to college engineering students who designed prize-winning small bridges. First prize of $250 went to Jim Brodt, Iowa State College.

—o—

Keystone Steel & Wire Co., Peoria, Ill., recently honored 61 employees who have completed 25 years' service this year. Keystone now has 320 employees with this length of service, approximately 12 per cent of its total roster.

—o—

Dominion Bridge Co. Ltd., Lachine, Que., is building an all-aluminum bridge 500 ft. long at Arvida, Que.

—o—

Babcock & Wilcox Co., New York, reports that a newly-developed x-ray unit will receive its first commercial use at the Beaver Falls, Pa., plant of Babcock & Wilcox Tube Co. where it will be used for industrial research in the manufacture and application of tubing. The unit makes possible non-destructive, quantitative analysis of the elemental constituents of metals, alloys, etc.

—o—

Marley Co. Inc., Kansas City, Kans., manufacturer of cooling towers, water cooling equipment and spray nozzles, has opened a district office at 1112 Packard Bldg., Philadelphia. Robert M. Sharp is in charge.

—o—

Lindsley & Voss, Chicago, distributor for electric industrial trucks and motorized hand trucks manufactured by Automatic Transportation Co., has opened a new service department. To expand its maintenance and repair facilities, Lindsley & Voss recently acquired Austin Industrial Truck Sales & Service Co. Inc., Oak Park, Ill.

—o—

Welbilt Products Co., manufacturer of disappearing stairways, plans to consolidate its Memphis, Tenn., and Pine Bluff, Ark., plants at 1010 Beech St., North Little Rock, Ark.

—o—

Continental Foundry & Machine Co., East Chicago, Ind., manufacturer of steel castings, rolling mill equipment and many other products, has purchased Northern Equipment Co., Erie, Pa., manufacturer of automatic water feed regulators for steam boilers, and Vulcan Soot Blower Co., Du Bois, Pa.

—o—

Iowa State College, Ames, Iowa, in conjunction with the expansion of the Ames Laboratory of U. S. Atomic Energy Commission, is constructing an administration building with office and laboratory facilities for its Institute for Atomic Research and plans to begin a synchrotron building this summer.

—o—

Automatic Transportation Co., Chicago, manufacturer of electric industrial trucks and motorized hand trucks, has named Standard Car Sales Inc., Chicago, as its railroad sales agency for railroads maintaining purchasing offices in Oklahoma, Kansas, Iowa, Michigan, Indiana, Ohio, West Virginia, Wisconsin, Kentucky and Illinois.

—o—

Stoker Manufacturers' Association, Chicago, reports that factory sales of mechanical coal stokers of all sizes and types in April amounted to 4826 units, a decrease of 10 per cent from the 5339 units sold in March, but an increase of 14 per cent above the 4235 units sold in April, 1947.

—o—

United States Rubber Co., New York, has published a catalog and price list covering high-speed grinding wheels used by steel mills, foundries and metal fabricating plants.

—o—

Wickman Mfg. Co., Detroit, has been organized to take over from Wickman Corp. the manufacture and sale of diamond wheels and related products. Headquarters and personnel for the new organization remain the same. Officers include A. C. Wickman, president; Hans Mandel, executive vice president; Harold Godwin, vice president.

—o—

Cutler-Hammer Inc., Milwaukee, electrical manufacturer, has moved its Houston, Tex., sales office to 2415 San Jacinto St.

—o—

Burstein Co., Keenan Bldg., Pittsburgh, has been newly formed as an iron and steel scrap brokerage firm by Charles C. Burstein, for the past 16 years associated with M. N. Landay Co., scrap broker, Pittsburgh.

—o—

Barium Steel Corp., New York, holding and management company with various subsidiaries in the metalworking industry, has opened an office at DuPont Circle Bldg., 1344 Connecticut Ave., Washington, D. C. W. E. Jubien is Washington representative and will co-ordinate sales activities of Barium subsidiaries with the various U. S. departments and foreign agencies.

—o—

Federated Metals, division of American Smelting & Refining Co., New York, has moved its New England office to the Statler Office Bldg., 20 Providence St., Boston. Former address was 250 Stuart St., Boston.

—o—

American Cladmetals Co., Carnegie, Pa., reports that production, initially of stainless clad copper, has begun at its Wilmington, Del., unit which has a capacity of 75,000 pounds of cladmetal per month.

—o—

American Society for Metals, Cleveland, has released a booklet titled "Your Career in the Metallurgical Profession," which aims to show advantages and opportunities in the metallurgical field for science students. The booklet was prepared by John W. W. Sullivan of the staff of American Iron & Steel Institute with the co-operation of ASM's Committee on Metallurgical Education.

The Business Trend

BALANCE of individual indicators of the industrial production trend was evident in mid-June, STEEL's index of activity being unchanged in the June 19 week at 168 per cent (preliminary) of the 1936-1939 weekly average. Compensation for the easing off of auto output was provided by gains in power use.

On the whole, basic indicators of production and trade have weathered the materials and labor storms of the past four months and would now appear to be headed for smooth sailing on a tranquil labor sea were it not for the ominous cloud of the coal situation which is almost directly overhead.

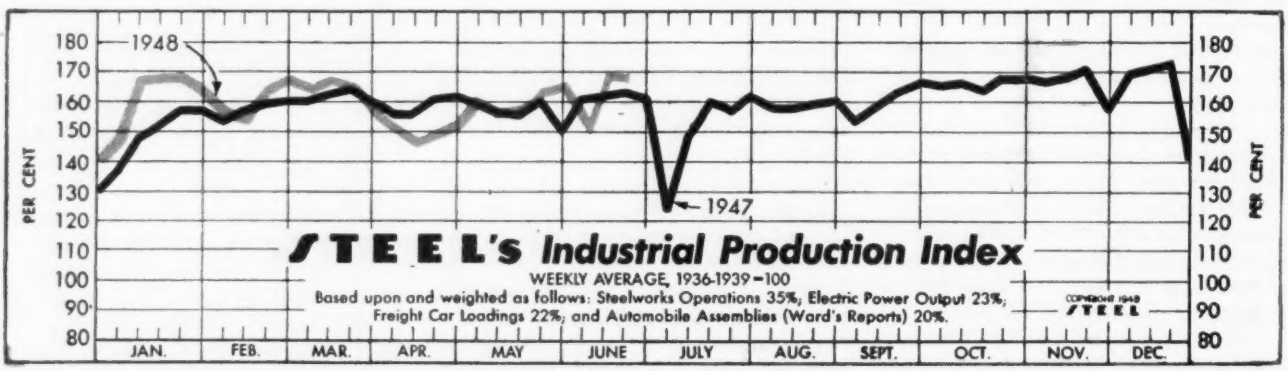
SALES—Production difficulties arising out of coal and steel shortages limited sales of most durable goods industries in April, a condition which would promptly repeat if the coal miners decide to take another walk. Durable goods manufacturers, according to the Department of Commerce, rang up sales of $6.8 billion, $600 million less than in March. This decline and that suffered in the nondurables caused a $1 billion slump in sales of all industries from March. However, at $17.1 billion sales were $1.7 billion over April, 1947, and while a large portion of the increase was due to higher prices, the unit volume was also larger this year. New ordering was off 5 per cent in the aggregate in April, with durables dropping 6 per cent. This apparent decline centered entirely in the iron and steel industry where there is no substantiation of the evidence indicating contraction in demand.

STEEL—Metalworking companies, while cognizant of the efforts being made by steel mills to work off backlogs as quickly as possible and thankful that operations have been maintained at the 95 per cent-plus level since mid-May, nevertheless still feel a pinch from insufficient supplies. Slight easing in demand may occur next month as the result of mass vacations in consuming plants but curtailed allotments of many products in that month foretell of continuing unsatisfactory supply-demand relationships.

AUTOS—Domestic and Canadian production of cars and trucks, although still over 100,000 units a week, suffers visibly from lack of steel—General Motors after a week's shutdown of its Michigan operations closed most of its other plants for a similar breather in order to accumulate stocks. Higher prices in many lists now emphasize the costs of labor peace.

PRICES—Advances of more than 1 per cent in wholesale foods and chemicals prices in the week ended June 12 pushed the Bureau of Labor Statistics index up 0.4 per cent to 164.9 per cent of the 1926 average. Industrial raw materials and manufactured products, at 181.6 per cent and 159.3 per cent, respectively, were also up 0.4 per cent from the previous week.

BUYING—Retail sales volume rose to an alltime high in May but, according to Dun & Bradstreet Inc., slight demand for luxury goods existed and requests for credit and installment purchases continued to increase. Collections from these sales, although prompt, were slightly slower than a year ago.



Index (chart above): Week ended June 19 (preliminary) 168 Previous Week 168 Month Ago 162 Year Ago 163

BAROMETERS of BUSINESS

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	96.0	96.0	95.0	96.5
Electric Power Distributed (million kilowatt hours)	5,159	5,132	5,085	4,676
Bituminous Coal Production (daily av.—1000 tons)	2,217	2,164	2,206	2,099
Petroleum Production (daily av.—1000 bbl.)	5,492	5,479	5,439	5,114
Construction Volume (ENR—Unit $1,000,000)	$126.9	$174.1	$82.7	$94.5
Automobile and Truck Output (Ward's—number units)	107,249	109,831	91,138	102,545

* Dates on request. † 1948 weekly capacity is 1,802,476 net tons. 1947 weekly capacity was 1,749,928 net tons.

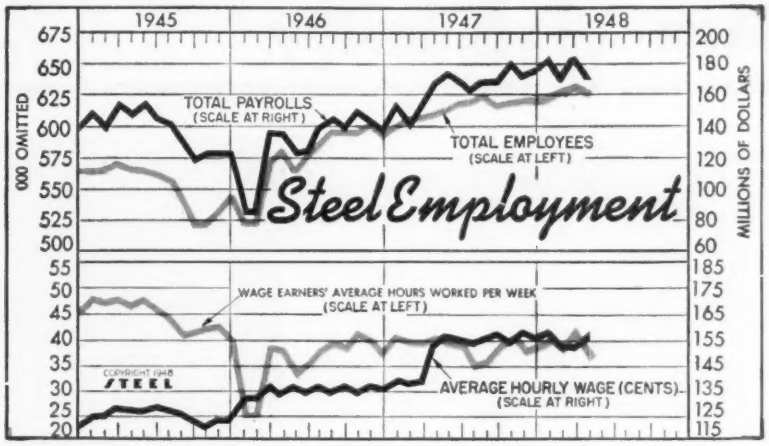
TRADE				
Freight Carloadings (unit—1000 cars)	910†	907	879	901
Business Failures (Dun & Bradstreet, number)	100	110	92	70
Money in Circulation (in millions of dollars)‡	$27,808	$27,864	$27,690	$28,195
Department Store Sales (change from like wk. a yr. ago)‡	+1%	−4%	+8%	+6%

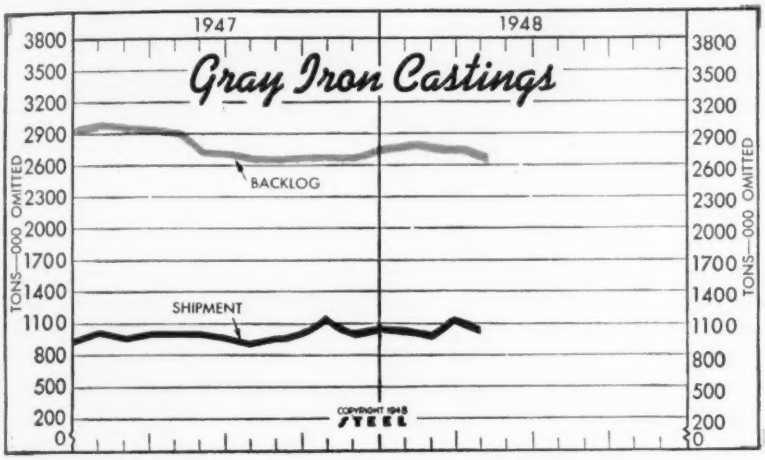
† Preliminary. ‡ Federal Reserve Board.

Steel Employment

	Employees† (000)		Total Payrolls (millions)		Hourly Wages† (cents)	
	1948	1947	1948	1947	1948	1947
Jan.	622	601	$180.2	$155.8	157.3	138.1
Feb.	626	607	167.6	139.5	155.1	137.0
Mar.	629	609	183.0	150.6	154.8	137.9
April	626	611	168.5	168.3	155.1	153.3
May	...	615	....	175.8	....	155.6
June	...	623	....	167.6	....	154.7
July	...	623	....	163.2	....	153.9
Aug.	...	625	....	169.1	....	155.6
Sept.	...	618	....	168.9	....	157.1
Oct.	...	620	....	180.1	....	154.6
Nov.	...	624	....	171.0	....	158.7
Dec.	...	621	....	175.3	....	156.5

† Monthly average.





Gray Iron Castings

(U. S. Bureau of Census)

Tons—000 omitted

	Shipments		Backlogs*	
	1948	1947	1948	1947
Jan.	1,064	1,078	2,803	3,021
Feb.	1,024	1,010	2,769	2,987
Mar.	1,169	1,090	2,726	2,979
Apr.	1,051	1,097	2,691	2,908
May	....	1,097	....	2,783
June	....	1,038	....	2,711
July	....	913	....	2,657
Aug.	....	952	....	2,631
Sept.	....	1,025	....	2,680
Oct.	....	1,154	....	2,669
Nov.	....	1,020	....	2,687
Dec.	....	1,066	....	2,782
Total		12,541		

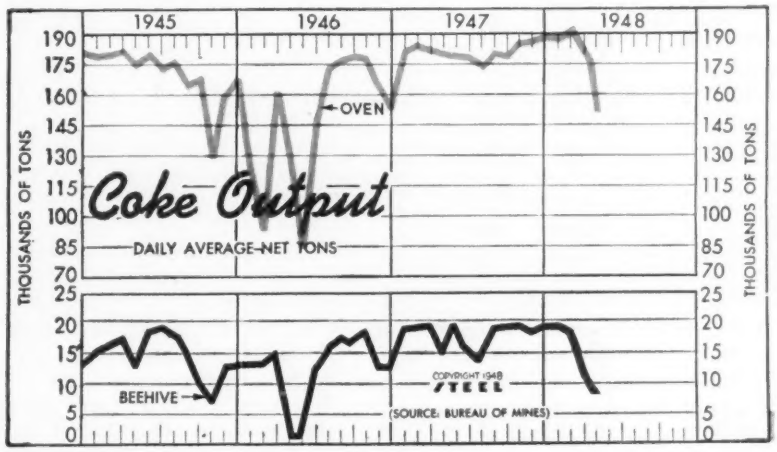
* Unfilled orders for sale to the trade.

Coke Output

Bureau of Mines

(Daily Average—Net Tons)

	Oven		Beehive	
	1948	1947	1948	1947
Jan.	189,191	181,245	19,554	18,124
Feb.	190,098	183,189	18,596	18,372
Mar.	182,340	182,529	10,458	18,725
Apr.	149,692	179,428	8,205	14,591
May	.....	178,398	.....	18,922
June	.....	177,416	.....	15,054
July	.....	173,312	.....	13,582
Aug.	.....	181,697	.....	18,346
Sept.	.....	179,872	.....	19,397
Oct.	.....	187,009	.....	19,786
Nov.	.....	188,342	.....	18,316
Dec.	.....	189,886	.....	19,454
Ave.	.....	181,860	.....	17,722



FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$14,244	$13,071	$14,731	$13,207
Federal Gross Debt (billions)	$251.5	$251.8	$252.2	$257.4
Bond Volume, NYSE (millions)	$25.2	$27.7	$28.7	$18.4
Stocks Sales, NYSE (thousands)	7,727	7,542	13,372	4,711
Loans and Investments (billions)†	$63.4	$62.9	$63.2	$63.0
United States Gov't. Obligations Held (millions)†	$35,667	$35,218	$35,499	$38,817

† Member banks, Federal Reserve System.

PRICES

STEEL's composite finished steel price average	$80.27	$80.27	$80.27	$69.82
All Commodities†	164.9	164.2	163.5	147.6
Industrial Raw Materials†	181.6	180.9	177.7	161.2
Manufactured Products†	159.3	158.6	159.0	142.9

† Bureau of Labor Statistics Index, 1926=100.

Men of Industry

CHARLES E. CLEMINSHAW

GILFRY WARD

ROBERT KYLE

Charles E. Cleminshaw has been appointed chief industrial engineer, Parker Appliance Co., Cleveland. He joined the company after serving for the past two years as manager, new business department, National City Bank of Cleveland. During the war he was variously associated with the Office of Production Management, War Production Board, and with the War Department in connection with production of tanks and combat vehicles. From 1933-41, Mr. Cleminshaw was an industrial engineer for Republic Steel Corp. **John W. Overbeke** has been appointed staff engineer for special projects for Parker Appliance Co. He will direct development in special aircraft projects, including fuel system accessories and jet engine components. He entered the aircraft field in 1926, and has since had association with Glenn L. Martin Co., Great Lakes Aircraft, and from 1942-46 was chief engineer of Simmonds Aerocessories Inc., New York. Prior to joining Parker, Mr. Overbeke served several firms in both New York and Cleveland as consulting engineer.

—o—

Chicago Malleable Castings Co., Chicago, announces election of the following officers and directors: **John T. Llewellyn II,** president; **Leon J. Wise,** vice president and director; **Leonard F. Hartwig,** director.

—o—

Richard O. Horning has been elected to the position of assistant treasurer, Mesta Machine Co., Pittsburgh. His entire business career has been spent with Mesta Machine Co. He served since 1934 in various departments, and previous to his present appointment was a sales engineer specializing in rolls. He succeeds the late **John Edwards.**

—o—

Gilfry Ward has been appointed vice president, Kellogg Division, American Brake Shoe Co., New York. He has been with the company for the past 20 years. In addition to his new duties, Mr. Ward will continue to serve as vice president of the company's American Manganese Steel Division, a position which he has held since 1938, and will continue to be located in Oakland, Calif.

—o—

Fred C. Foy, vice president, J. Walter Thompson Co., has accepted an appointment as vice president and manager of the sales department, central staff, of Koppers Co. Inc., Pittsburgh. As general manager of the Detroit office of the Thompson organization, Mr. Foy also has been supervisor of all phases of the Ford Motor Co. advertising, which is handled by that agency. He will leave Thompson Co. July 1, and will assume his new duties at the Pittsburgh headquarters of Koppers on Aug. 1. The appointment of Mr. Foy fills a vacancy created last Apr. 1, when **E. J. McGehee,** vice president and sales manager of Koppers, was assigned responsibility for the company's wood preserving activities in the western half of the United States. **Ralph Winslow,** Koppers' director of public relations, who has been serving as acting manager of the sales department, will continue to guide activities of both departments until Mr. Foy takes up his new duties there.

—o—

John H. Matthews, vice president and director, Raybestos-Manhattan Inc., Passaic, N. J., has been elected to the board of directors, Canadian Raybestos Co. Ltd., an operating unit of Raybestos-Manhattan Inc. Mr. Matthews is in charge of the Manhattan Rubber Division at Passaic, and has been with Manhattan since 1914.

—o—

Robert Kyle has joined Gas Machinery Co., Cleveland, as gas sales engineer. He formerly was Cleveland branch manager, General Controls Co., and prior to that was gas engineer, Iroquois Gas Corp., Buffalo. In his new position, Mr. Kyle will serve gas companies and other industrial plants for which Gas Machinery Co. is designer, fabricator, or erector.

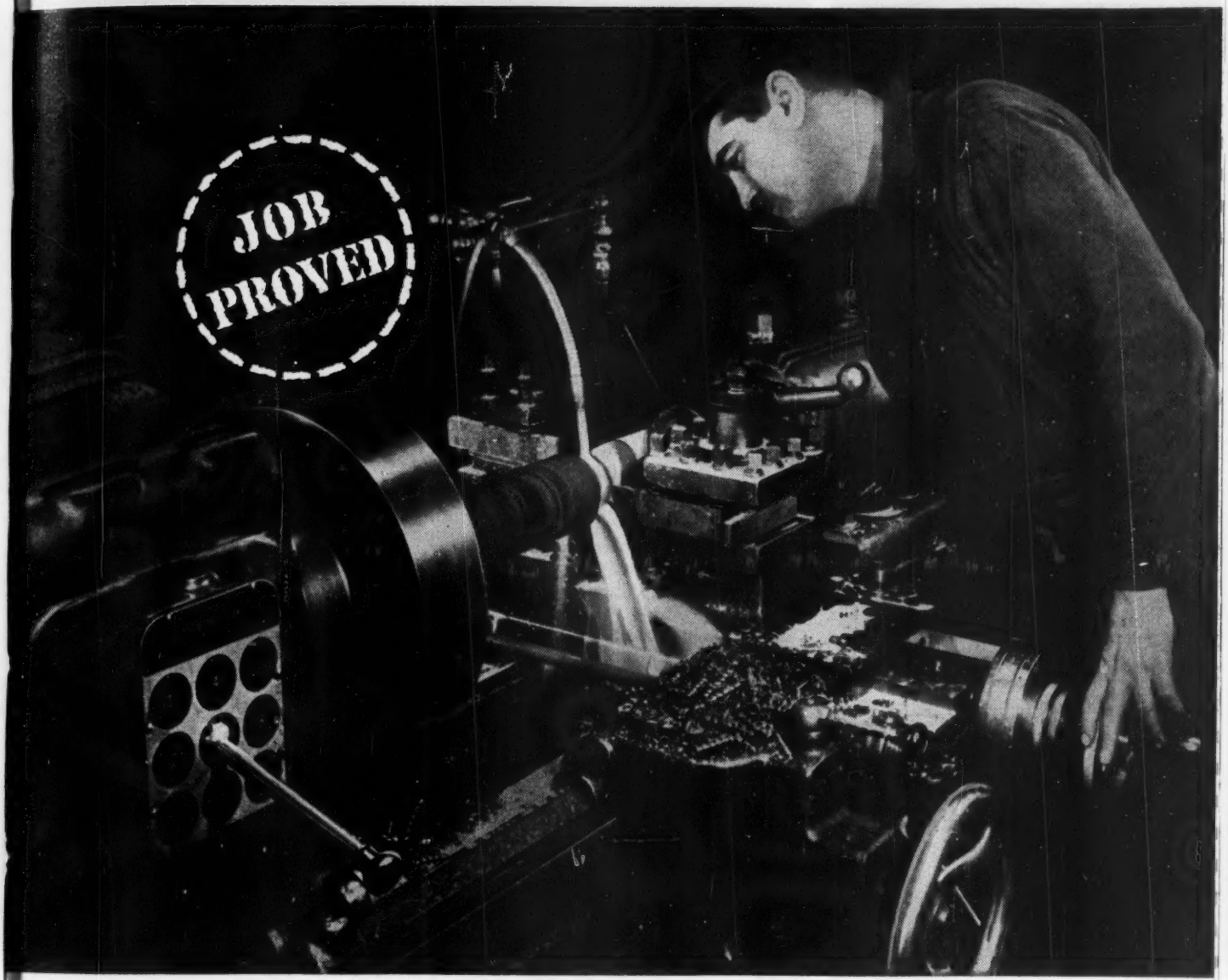
—o—

Robert B. Parker has been appointed manager of sales, Washington special accounts office, Carnegie-Illinois Steel Corp., U. S. Steel Corp. subsidiary. He succeeds **L. R. Knapp,** who is retiring. Mr. Parker came to the sales department of Carnegie-Illinois in 1940 and the same year was appointed assistant to manager of sales, New York district sales office, the position he leaves to accept his new post.

—o—

Cincinnati Steel Products Co., Cincinnati, announces election of the following officers: **J. W. Herr,** chairman of the board of directors; **William F. Colclough,** president and general manager; **Robert H. Klein,** treasurer; and **H. L. Greer,** secretary. John W. Herr, who founded the company, will continue to actively participate in the management of the company as chairman of the board. Mr. Colclough has been with the company for 15 years, having served as sales manager,

3/8" Cut on S.A.E. 4640 Steel



SUNOCO EMULSIFYING CUTTING OIL

Permits Heavy Cut on 5" Heat-Treated Shaft

Here is a tough job, just one of thousands in which Sunoco makes possible fast, accurate machining:

Machine — 20" x 96" "American" Pacemaker multi-production lathe
Operation — Turning 5" diameter shaft
Material — S.A.E. 4640 steel, heat-treated
Spindle Speed — 133 r.p.m.
Cutting Speed — 175 s.f.p.m.
Depth of Cut — 3/8"
Feed — .015"
Tool — Cemented carbide
Cutting Lubricant — One part Sunoco to 20 parts water

For greater production, greater accuracy, smoother finish, put Sunoco, the "Job Proved" oil, to work in your shop. Sunoco quickly forms a stable emulsion when mixed with water. It has high lubricating and cooling qualities and is recommended for ferrous and nonferrous metals, alloy and carbon steels. For full information, or for a free copy of "Cutting and Grinding Facts," call the nearest Sun office today, or write Department S-6.

SUN
SUNOCO
INDUSTRIAL PRODUCTS

SUN OIL COMPANY · *Philadelphia 3, Pa.*
IN CANADA: SUN OIL COMPANY, LTD., TORONTO AND MONTREAL

secretary and vice president. The company also announces that effective July 1, **Thomas E. Brannen** will be manager of steel sales, **Russell T. Hayes,** manager of specialty sales, and **William Kroening,** manager of sheet metal and contractor sales.

—o—

T. A. McDermott, formerly of Hennessey & McDermott, Philadelphia, has joined the Dreifus Steel Corp., Philadelphia, as manager of the new Aluminum Sales Division.

—o—

C. R. Brown has been appointed purchasing agent for the Cleveland plant of E. W. Bliss Co., to succeed **Edward E. Ebel,** named production manager. Before transferring to Cleveland, Mr. Brown was with the company's Brooklyn plant for ten years, and the Toledo plant for five years. He was the purchasing agent for the Brooklyn plant.

—o—

Frank L. Johnson, vice president, Pressed Steel Car Co. Inc., has been placed in charge of railroad sales. He will have headquarters in Chicago.

—o—

John M. Otter has been elected vice president and general sales manager, Philco Corp., Philadelphia. He joined Philco Corp. in 1926, and for the past year has been general sales manager of the corporation.

—o—

Lloyd L. Lee, formerly vice president in charge of sales and engineering, Plan-O-Mill Corp., Hazel Park, Mich., has joined the staff of Cleveland Republic Tool Corp. as manager of its Detroit office.

—o—

Lawrence H. Taylor has been elected vice president in charge of research of the New York design firm of Lippincott & Margulies Inc. He previously had been director of research of the firm. Prior to his association with Lippincott & Margulies Inc., Mr. Taylor was an industrial consultant as an associate of Charles H. Welling & Co. Inc., New York.

—o—

Earl T. Herniman has been appointed manager of the new Waukesha Engine Division, H. D. Taylor Co., Buffalo. Mr. Herniman was formerly sales manager of the Sterling Engine Co., Buffalo.

—o—

S. Mason Bartlett has been appointed distributor representative, Eastern Stainless Steel Corp., Baltimore. Most recently Mr. Bartlett has been associated with Davison Chemical Corp., and previous to that was with Snap-On Tools Corp., Kenosha, Wis., in the capacity of district sales manager.

—o—

Arthur W. DeBoves, formerly secretary-treasurer, McLaren Screw Products Co., Detroit, has been appointed general manager, Harold F. Howard Co., Detroit, management consultant.

—o—

Samuel L. Simmons has been named plant manager, Chicago branch assembly plant, Ford Motor Co., succeeding **E. M. Buell,** who retired June 1. Formerly branch plant manager, Louisville, Ky., Mr. Simmons is succeeded by **Ralph W. Settles,** who has been transferred from Kansas City, Mo.

—o—

Gaetan M. Zucco has been appointed contracting manager, Fabricated Steel Construction Division, Bethlehem Pacific Coast Steel Corp., San Francisco. He will cover the four Northwest states. Except for four years spent with the Army Engineer Corps in the Pacific, Mr. Zucco has been with the Bethlehem organization in the Northwest since 1927.

—o—

Al Vos has been appointed manager, Detroit office, Yale & Towne Mfg. Co., to handle the sale of Yale automotive locks and specialty hardware to manufacturers in Michigan. When in full operation, the new Specialties Division, headed by **Mark A. Miller,** general manager, will make a variety of locks and hardware used as components in the products made by other manufacturers, such as automobiles, luggage, office equipment, business machines, vending machines, lockers, etc.

—o—

John C. Haas, secretary, United States Radiator Corp., Detroit, has been elected a vice president in addition to his present office. An employee of the company for 38 years, he was named production manager in 1946 after serving as assistant to the general sales manager and assistant to the manager of the operating department.

—o—

Wayne R. Sphar has been recently appointed advertising manager, Freedom-Valvoline Oil Co., Freedom, Pa. He succeeds **A. J. Kilgariff,** who will devote his efforts to the development of a line of consumer products for future marketing. Mr. Sphar formerly served as advertising manager, Jessop Steel Co., Washington, Pa.

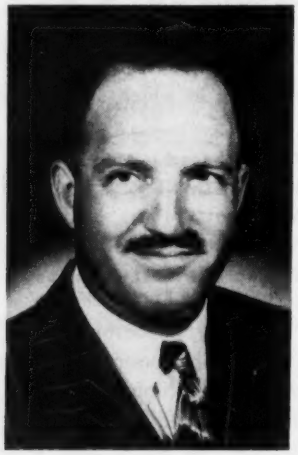
—o—

Charles Cromwell has been appointed division sales manager, Threadwell Tap & Die Co., Greenfield, Mass., for the north central territory including Illinois, Wisconsin, Minnesota, Missouri and Iowa. Mr. Cromwell has been associated with the Threadwell organization since it was acquired by Sheffield Corp. about two years ago, and prior to that spent many years with the Sheffield organization in Detroit.

—o—

Roger M. Scott has joined Morgan Construction Co., Worcester, Mass.,

LLOYD L. LEE

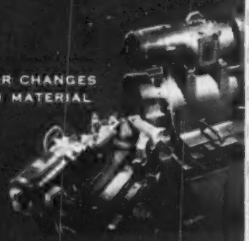


GAETAN M. ZUCCO

CHARLES CROMWELL

FOR POSITIONING

CONVEYORS



On thousands of applications, stepless variable speed operation assures exactly the right speed for every operation . . . for each operator . . . the right speeds for each change in the consistency or shape of the material being processed. Such variable speed operation pays off in higher rates of production, a better quality product and more efficient performance of your equipment and your operators.

variable speed operation doesn't cost IT PAYS

Master Speedrangers provide this infinitely variable speed in compact, all-metal, mechanical variable speed units in a wide range of types and sizes.

For example, see how the Speedrangers on the applications shown above incorporate an electric motor, a variable speed unit and a gear reduction . . . all standard Master units that easily combine into a compact, integral power. This provides exactly the right speed, the right features, in a unit that you can use right where you want it.

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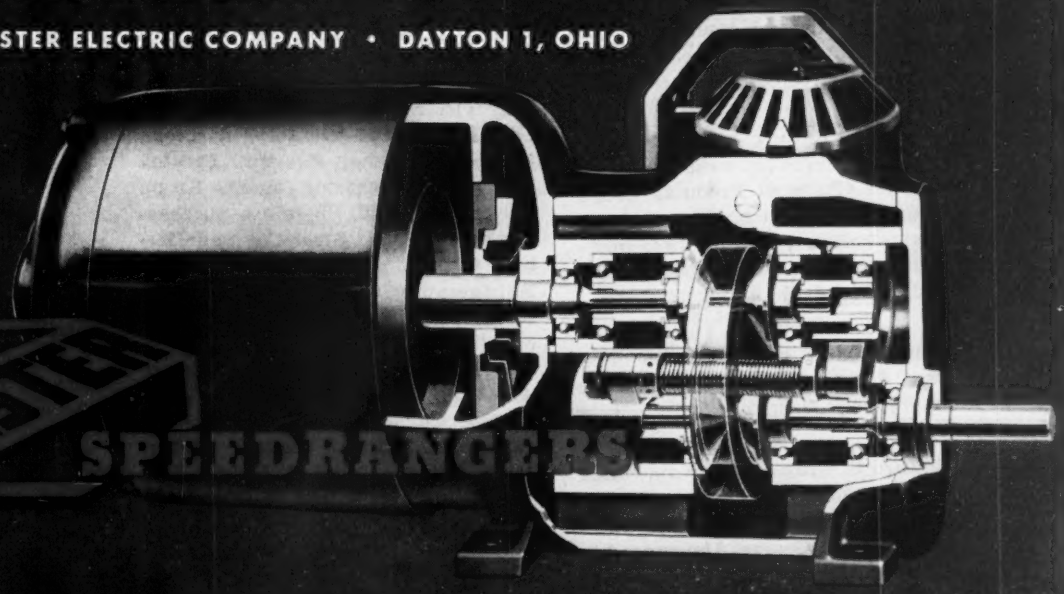


as engineer in the wire machinery department. He has previously been with the New England Butt Co. of Providence, R. I., as sales manager.

—o—

Walter Geist, president, Allis-Chalmers Mfg. Co., Milwaukee, has been awarded an honorary doctor of engineering degree by Michigan College of Mining & Technology at Houghton, Mich.

—o—

Edward M. Borger, president, Peoples Natural Gas Co., Pittsburgh, has been elected a director of Dravo Corp., Pittsburgh. Mr. Borger fills a vacancy created by the retirement of **S. G. Cooper,** who had served continuously since 1917 when he was elected a director of Keystone Sand & Supply Co., which in 1930 became a division of the corporation. Mr. Borger has been president of Peoples Natural Gas Co. since 1940, and is a director of that company and the Consolidated Natural Gas Co.

—o—

Ralph H. Maxson, president, St. Paul Foundry & Mfg. Co., St. Paul, Minn., has been elected chairman of the board of directors, W. L. Maxson Corp., New York engineers and manufacturers, a newly created position. Mr. Maxson has been a member of the board since the incorporation of the company in 1935.

—o—

Joseph D. Lear, development and production consultant, Silver Creek Precision Corp., New York, has been appointed chief tool and design engineer for the company. **A. E. Gordon-Smith** has been appointed general superintendent of production and engineering for the company. He was associated for 17 years with E. W. Bliss Co. of Brooklyn.

—o—

Dr. Haldon A. Leedy, acting director, Armour Research Foundation, Illinois Institute of Technology, has been named director.

—o—

Joseph A. Korany has joined the research and development laboratories of Quaker Chemical Products Corp., Conshohocken, Pa. He will undertake market studies, including field testing, of new products as well as new applications of old products.

—o—

Leon Burnett has been appointed works manager, Bardes Forge & Foundry Co., Cincinnati.

—o—

Edward G. Gray has been appointed works engineer, laminated plastics plant in Coshocton, O., General Electric Corp., and **George Alexander** has been appointed assistant to the manager of the plant, and will be in charge of the Coshocton Works' new varnish plant.

—o—

Danforth K. Heiple, a field engineer for R. G. LeTourneau Inc., Peoria, Ill., has been promoted to the position of chief field engineer for the company.

—o—

Walter H. Leo has been named district manager of Sheffield Steel Corp.'s Texas office, and will make his headquarters in Dallas. He has been with the company for seven years.

—o—

John W. Beaver has been named sales representative for the Special Chemicals Division, Pennsylvania Salt Mfg. Co., in the newly-created Maryland, Washington, D. C., and Virginia district. He formerly had been sales representative in the Wisconsin territory.

—o—

Frank R. Kohnstamm has been elected vice president, Jack & Heintz Precision Industries Inc., Cleveland. Mr. Kohnstamm joined the company last October as general sales manager.

—o—

Norman P. Hitchcock has been appointed assistant superintendent of maintenance (electrical) at the Brier Hill works of Youngstown Sheet & Tube Co., Youngstown, succeeding **Louis C. Breetz,** retired.

—o—

Purchasing Agents Association of Chicago announces its new officers for 1948-1949 as follows: **Wallace B. Burnet,** purchasing agent for Imperial Brass Mfg. Co., has been elected president, succeeding **W. MacNider** of Economy Casting Service Co. **Arthur F. Dallia,** purchasing agent, Justrite Mfg. Co., has been elected first vice president, and **Milford Hunter,** purchasing agent, Continental Can Co. Inc., elected second vice president. **Carl L. Otremba** will serve a second term as national director. **Preston C. Patch,** purchasing agent, Kropp Forge Co., **F. W. Shymkus,** purchasing agent, Acme Steel Co., and **Herbert C. Hill,** purchasing agent, Dole Refrigerating Co., are new additions to the association's board of governors. The board is also composed of **W. D. Jackson,** Container Corp. of America; **E. S. Page,** Great Lakes Carbon Co.; **Robert Sedgwick,** Chicago Hardware Foundry; **Robert Doyle,** Glidden Co.; **J. F. Knight,** University of Illinois; and **E. A. Fandell,** Northern Trust Co.; **Larry Seen,** Borg and Beck Division, Borg-Warner Corp., has been re-elected for his 11th consecutive term, and **Harry Wise,** Scovill Mfg. Co., enters his ninth consecutive term as treasurer.

EARL A. GARBER

Will succeed to the presidency of Harbison-Walker Refractories Co., Pittsburgh, July 1 upon the retirement of Raymond Willey. Noted in STEEL, June 14 issue, p. 80

—o—

Dr. Henry H. Hausner has been appointed a member of the staff of the metallurgical research and development laboratories of Sylvania Electric Products Inc., Bayside, N. J. Dr. Hausner, a research associate and professor in the graduate division at New York University, will specialize in powder metallurgy for application to electron tubes, lighting and special products.

—o—

James L. Erickson has been appointed to the position of regional sales representative in southern Ohio and Indiana, Production Die Cast Co., Grand Rapids, Mich. He will make his office in Dayton, O.

—o—

Frank J. Hoder Jr. has been appointed manager, Packard Motor Car Co.'s marine and industrial engine department. For the past six years he has been general manager and chief engineer, Marine Products Co., Detroit, and in 1940-42 was a consulting engineer to the U. S. Navy Bureau of Ships.

—o—

Dow Chemical Co.'s Magnesium Division has recently extended its system of individual sales managers by appointing **J. C. H. Stearns,** manager of ingot sales, **G. W. DeKuiper,** manager of wrought product sales, and **T. H. Caldwell Jr.,** manager of die castings sales.

—o—

C. J. Gaspar, who has been assistant general sales manager, Nichols Wire & Aluminum Co., Davenport, Iowa, has resigned, and will be associated with American Machine & Metals

A. B. MUSKETT

Appointed vice president-manufacturing, General Electric X-Ray Corp., Milwaukee. Noted in STEEL, June 21 issue, p. 84

FRED H. McCURDY

Elected president and a director of Brooks Oil Co., Cleveland. Noted in STEEL, June 14 issue, p. 80

E. J. G. PHILLIPS

Elected president, Monorail Manufacturers Association, New York. Noted in STEEL, June 21 issue, p. 84

Co. Inc., East Moline, Ill., as sales manager of the DeBothezat Fans Division.

—o—

H. P. Saxer has been appointed superintendent, blast furnace department, Pittsburgh Works, Jones & Laughlin Steel Corp. **D. L. Hykes** will continue as assistant superintendent of that department, and **J. R. McCarney** has been appointed assistant to the superintendent.

—o—

Douglas B. Whitney has been appointed general manager, Harrison Radiator Division, General Motors Corp., at Lockport, N. Y. He succeeds the late **Frank M. Hardiman.** Mr. Whitney formerly was works manager of the Lockport plant.

—o—

Robert S. Jude has been appointed assistant vice president, Spencer Kellogg & Sons Inc., Buffalo. He was placed in charge of the oil seeds purchasing department.

—o—

National Gypsum Co., Buffalo, has appointed three commodity advertising managers and public relations manager as follows: **Stephen F. Tucker,** gypsum and metal products advertising; **John J. Hickey,** paint and insulation board; **Frederick C. Egloff,** acoustical products; and **David A. White Jr.,** public relations.

—o—

Morton-Gregory Corp., Toledo, O., announces election of **Leonard C. Barr, Maurice A. Enright,** and **William J. Kane** as vice presidents. Mr. Barr, general sales manager of the Nelson Stud Welding Division, Lorain, O., and Mr. Enright, general works manager of the Nelson plant, Lorain, have been added to the board of directors of the corporation. Mr. Kane is sales manager of consumer products for Morton-Gregory, with offices in Toledo, and is one of nine original directors who were re-elected.

—o—

George B. Mackey, who joined Westinghouse Electric Corp. as a lamp salesman in Philadelphia 26 years ago, has returned there as manager of the Middle Atlantic district of the company's Lamp Division. **Harry A. Croasdale,** whom Mr. Mackey succeeds, has been appointed manager of the Lamp Division's newly-established Central Station Division.

—o—

Electric Metal Makers Guild announces the election of the following officers for the coming year: **A. J. Scheid Jr.,** Columbia Tool Steel Co., Chicago Hts., Ill., president; **F. O. Lemmon,** Ohio Steel Foundry Co., Springfield, O., vice president; **D. L. Clark,** Simonds Saw & Steel Co., Lockport, N. Y., secretary-treasurer.

—o—

M. A. Sievert has been appointed as an engineer in the technical service department, Reynolds Metals Co., Louisville. He has been engaged for a number of years in research leading to the development of new applications for aluminum, and has also devoted much time to the designing and making of dies of various types.

—o—

Dr. William J. Youden, mathematical statistician and chemist, has been appointed to the staff of the National Bureau of Standards as assistant chief, statistical engineering section.

OBITUARIES . . .

William T. Cooley, founder, Windsor Foundry Corp., Windsor, Vt., and president and general manager since the company's inception, died recently. Previous to founding this firm, Mr. Cooley was president and general manager, Cooley-Wright Mfg. Co., Waterbury, Vt.

—o—

Dr. John H. Holm, 76, president, Holm Mfg. Co., Kenosha, Wis., died June 18 following a short illness. Dr. Holm, with his brothers, organized the Holm Mfg. Co. in 1922, and during the period from 1941 to 1943, he was president of the Kenosha Manufacturers Association.

—o—

Oscar E. Hesse, 68, since 1940 secretary-treasurer, Logan Engineering Co., Chicago, died June 15.

—o—

Franklin B. Keiser Sr., 91, president, Keiser-Grismer Engineering Co., Birmingham, died June 18.

—o—

Thomas McSheehy, 60, who retired last November as Chicago district sales manager, Wickwire Spencer Steel Division, Colorado Fuel & Iron Corp., died June 21 in Chicago.

—o—

Alonzo H. Magee, 69, founder and president, New York Air Valve Corp., New York, died June 21. Mr. Magee founded the firm in 1928.

—o—

David M. Weir Jr., general sales manager, Pittsburgh Piping & Equipment Co., Pittsburgh, died June 17.

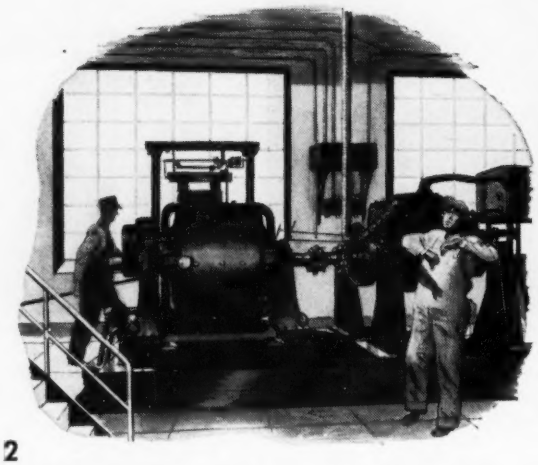
—o—

Alvin W. Belfour, 44, production superintendent, Chevrolet Motor & Axle Division plant, Tonawanda, N. Y., died June 22 in Buffalo following a heart attack.

Have a case of shock to cure?

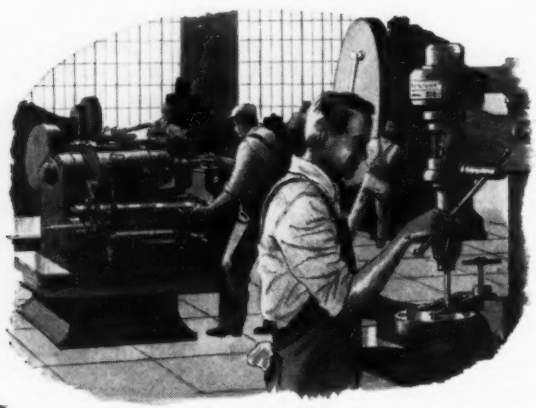
1

"Rev 'er up" is the cry as truck engines roar up to 3000 RPM on giant test stands. It's done to make sure they'll stand the gaff. But occasionally an engine gets ornery — backfires; stops suddenly. Shock! Plenty of it. But what's a backfire to you? Well, what Morse Chain Company did about it may be a boon to *your* business, too . . .



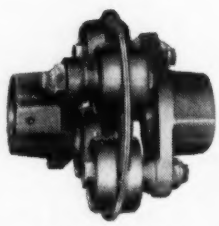
2

Shake, shock and shimmy were the problems Morse Power-Transmission Engineers found on test blocks: a natural for Morse Morflex Coupling. This versatile Morse product absorbs torsional shock, teeth-rattling vibration, and shaft misalignment. Morflex between engines and test blocks reduced bearing wear, protected equipment. This helps you to . . .

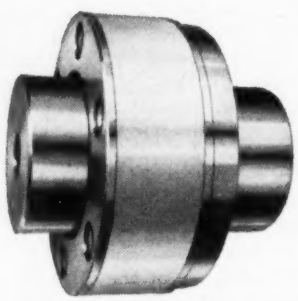


3

Save yourself a headache. Shafts, wheels and machines in your business can be safeguarded. When shaft vibration causes bearing failure it might be prevented by Morflex. *Wherever there is industry* they are adaptable to universal drive connections; allow no power loss; are sealed against dirt and moisture; free of metal-to-metal contact!



Morflex Coupling



Morflex Radial Coupling

4

Proof of outstanding performance? Call or write Dept. 196, Morse Chain Company, Detroit, Michigan. Hear case histories from experienced Morse Engineers. You'll soon see *how* and *why* Morse Couplings, Roller and Silent Chains, Sprockets and Clutches have been profitably applied by America's foremost manufacturers.

Roller Chain Drives

Roller Chain Couplings

Silent Chain Drives

MORSE

MECHANICAL POWER TRANSMISSION PRODUCTS

A PRODUCT OF BW BORG-WARNER

Free Wheeling Clutches

MORSE CHAIN COMPANY • DETROIT 8, MICHIGAN

Engineering News . . . AT A GLANCE

PUTS WASTE SPACE TO WORK— Paint drying area for long tapered tubes processed in the plant of Union Metal Mfg. Co., Canton, O., is located in waste space between crane and building columns. Here some 530 radiant type lamps, each rated at 250 watts and arranged in two horizontal banks with a space of 36 inches between them, are used for the quick-drying operation. The tubes, spray-painted inside and brushed by hand outside, are rolled from the painting racks onto four conveyor chains that carry them through the space between the two banks.

SUPER "SHAKER"— The Navy currently is using a vibration generator that is capable of exerting forces up to 44,000 pounds in investigating dynamic characteristics of ships. According to the Office of Technical Services, Washington, the unit—weighing 49,000 pounds, develops a vertical sinusoidal force with a maximum single amplitude of 44,000 pounds at speeds of 105 to 480 revolutions per minute. Is also generates a comparable maximum force of 11,700 pounds in the same direction at its lowest running speed of 54 revolutions per minute. Unit can be used to determine the stiffness of a bridge, its effective mass, and its natural frequency, or for relieving stresses in welded structures such as built up beams, trusses etc.

NEW SLAG POT-TIPPING METHOD— Down in Birmingham, Ala., slag pot-tipping or emptying the big cast-steel pots used to haul liquid slag from blast furnaces to the slag pits—at Tennessee Coal Iron and Railroad Co.—now is accomplished by compressed-air-driven pistons designed to operate in conjunction with diesel locomotives presently used on the company's internal lines. In order to carry out the task and, to jar the pots sufficiently to knock out skulls, the concern uses a special air compressor car which is coupled between the locomotive and the first slag pot of the train.

PRODUCTION BOOSTING "BREATH"— Output of present steelmaking facilities at Weirton Steel Co. will be increased some 20 per cent when its new $4 million oxygen plant now in process of construction, is completed late this year. According to company engineers, approximately 400 tons of oxygen are expected to be manufactured by the plant for use in speeding up smelting of iron in blast furnaces, or melting and purifying steel in open hearths. It is pointed out that a blast furnace now capable of producing 1000 tons of iron per day will produce 1200 tons when it starts to "breathe" oxygen-enriched air, and an open hearth rated at 400 tons per day will be able to increase its output to 500 tons daily.

CATHODIC PROTECTION IDEAL— According to studies made by Department of Commerce, Washington, it appears, under ideal conditions, that cathodic protection is a highly efficient means of combatting corrosion of steel. In six of a total of eight test sites, it is reported, corrosion of steel specimens was adequately prevented over test periods ranging from 3 to 6 years by connecting zinc cylinders to the steel. It was found that current required to prevent corrosion of steel electrolytically was about equal to current associated with normal corrosion and hence could be taken as a measure of the corrosion rate in the soils studied. Although a zinc-steel area ratio of 1:20 was sufficient for protection at three of these sites, an area ratio of 1:10 was required at the other three. At the other two sites, high resistivity and alkalinity of soil tended to reduce current output of zinc anodes so much that cathodic protection was not obtained.

HOOKED WITH A LIFT—Hydraulic lift is used by New York Air Brake Co., Watertown, N. Y., to raise cylinders so that they can be hooked by a monorail conveyor prior to traveling through the cleaning cabinet of the blasting machine. The railroad brake cylinders are brought to the machine on a roller conveyor. As they reach the loading station, a section of the conveyor is slid into position under a hook of the monorail system. After both interior and exterior surfaces of each cylinder are cleaned, it is returned to the front of the machine and again placed on the roller conveyor to be moved to the next operation. (p. 74)

PREVENTS DISMANTLING—When drawing, forming, piercing and blanking in a die, reservations must be made to replace or grind any station with least amount of dismantling, or disrupting alignment. E. J. Harris, die engineer, Brandes Press Co., Cleveland, points out that forming stations should always be arranged in the die in such a manner that they may be lowered to maintain alignment when grinding the top of blanking or piercing stations, or the blanking station may be raised the amount removed. Blanking or piercing sections have more die life and produce better results when the die can be ground inside as well as outside. This is essential in lamination dies where abrasive action of silicon steel wears down the cutting edge. (p. 78)

REVERT SCRAP "ABSORBER"—In a duplexing process developed by Babcock & Wilcox Tube Co., Beaver Falls, Pa., to absorb excessive amounts of stainless scrap coming from its tube-mill operations, extremely high recoveries of chromium are realized. It enables the company to use up 60 per cent chromium nickel scrap in the end-production of tube quality billets. In the process, lighter types of scrap generated in the conversion process are used directly in the arc furnace, while the heavier types, such as bloom and bar crops, are melted down in 5000-pound high frequency induction units and re-ladled to the arc furnace during the working of the heat. (p. 90)

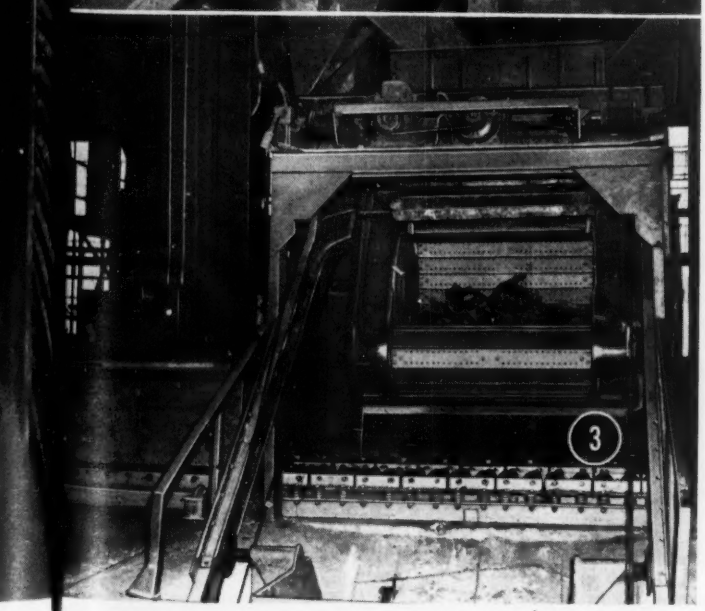
Handling for Blasting Operations . . .

CONTINUOUS WORK

. . . to abrasive cleaning machines maintained cl

KFLOW

ined clever arrangements



WITH the advent of airless abrasive blasting in 1933, a new problem was created in many high production shops—that of keeping a continuous, adequate supply of work flowing to the cleaning equipment. Standard types of loading and conveying equipment are widely used for eliminating this problem.

The accompanying illustrations demonstrate a few of these arrangements noted by engineers of American Wheelabrator and Equipment Corp., Mishawaka, Ind. Unfortunately, little quantitative data are available regarding savings effected by the various handling systems illustrated.

System illustrated in Fig. 2 was installed at Pontiac Motor Co., Pontiac, Mich., for conveying and sorting work before cleaning in the 48 x 42-inch Tumblast. Metal baskets laden with work to be cleaned are brought to the machine by means of an overhead conveyor loop and parts are dumped into sorting bins.

These bins empty into a vibrating under-flow hand conveyor leading to the loader. This arrangement permits small batches of different sizes and types of work to be classified and segregated into bins before filling the loader.

At Timken Detroit Axle Co., Detroit, an overhead conveyor with "tree" hooks is used for moving gears before and after cleaning on the Wheelabrator Tablast shown in Fig. 1. Speed of the conveyor and cleaning speed of the table are synchronized to permit continuous operation. The operator removes a scale encrusted gear from the hook and replaces it with a clean gear from the table.

Castings are unloaded directly into the steel tote boxes which are pushed in front of the 48 x 72-inch unit at Chapman Valve & Mfg. Co., Indian Orchard, Mass., Fig. 3. Roller conveyor tract is mounted to absorb the shock load of the heavy castings as they fall into the tote box. After the boxes are filled they are returned to the track at the left.

As shown in Fig. 4, a combination roller and monorail conveyor is utilized by New York Air Brake Co., Watertown, N. Y., to handle railroad brake cylinders through the cabinet. The cylinders are brought to the machine on the roller conveyor. When they reach the loading station, a section of the conveyor is slid into position under a hook of the monorail conveyor. By means of a hydraulic lift the cylinder is raised so it can be hooked and carried into cleaning cabinet.

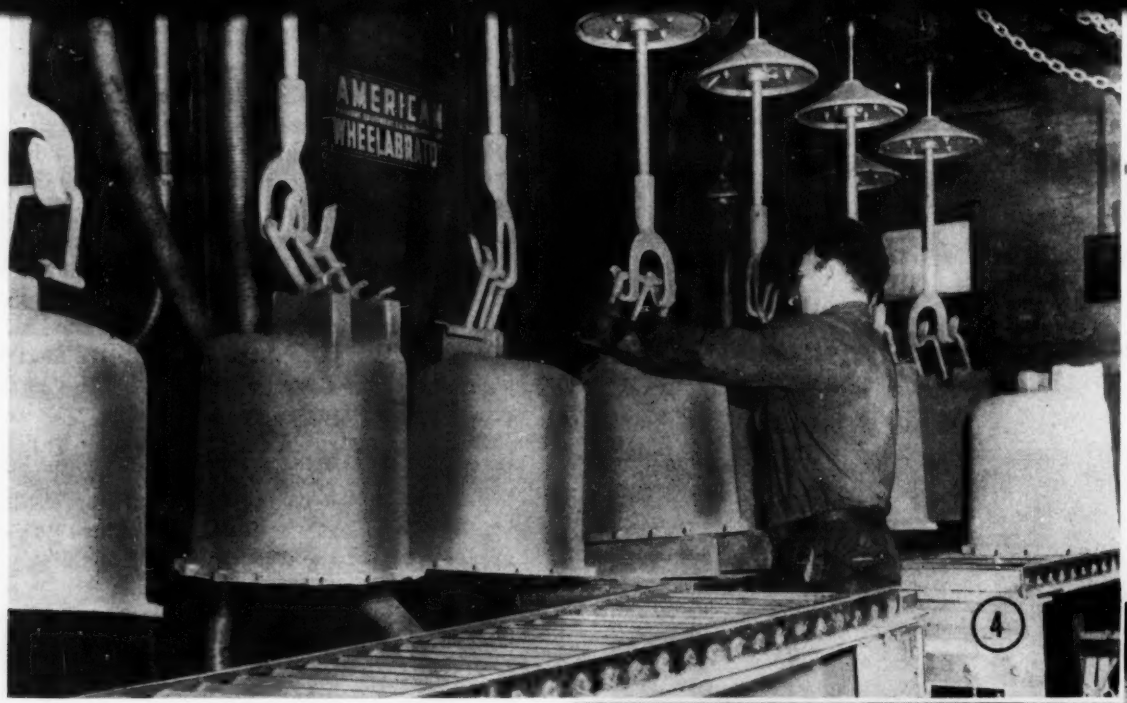
After both interior and exterior surfaces of the cylinder are cleaned, it is returned to the unloading station at the front of the machine where it is again placed on the conveyor to be moved to next operation.

Continuous cleaning of automotive connecting rods is illustrated in Fig. 6. The connecting rods are loaded onto a belt conveyor which carries a continuous stream of them into the continuous Wheelabrator Tumblast. After passing through the abrasive blast

Fig. 1—An overhead conveyor with "tree" hooks is used for moving gears before and after cleaning

Fig. 2—Work is conveyed and sorted before cleaning at this Pontiac Motor Co. installation

Fig. 3—Castings are unloaded directly into steel tote boxes which are pushed in front of this 48 x 72-inch cleaning unit



the connecting rods are discharged in a continuous stream on another belt conveyor which carries them to the inspection table.

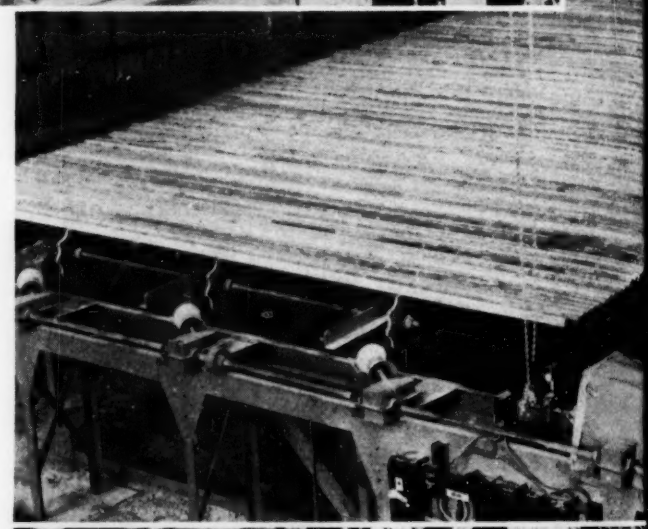
Fig. 5 illustrates the method of handling locomotive boiler flues which are being cleaned in a specially designed blast cleaning machine. The pipe is fed automatically onto the skewed dished rollers which convey the flues through the abrasive blast. Upon leaving the cleaning cabinet, the cleaned flues are picked up on the notched arms and raised to the storage platform where they roll to next processing operation.

The problem of rapid loading of a Wheelabrator swing table has been solved at the foundry, shown in Fig. 7, by the simple expedient of having an extra table top on hand. While one load is being cleaned the other table is being loaded. After cleaning it is a simple matter to remove the table load of cleaned castings and replace it with a table load of dirty castings by means of an air hoist.

Walworth Co., Greensburg, Pa., solved the problem of moving their malleable iron pipe fittings from the annealing ovens through the cleaning operation, the sorting tables, and on to the galvanizing department with an unusual conveying system. A continuous conveyor speeds the fittings from the shakeout to the loading bin located between the two 48 x 42-inch Wheelabrator Tumblasts. After the castings have been cleaned they are unloaded onto a belt conveyor located below floor level and carried to the mezzanine floor where they are emptied into a hopper over a circular "merry-go-round" sorting table.

A special setup was developed by Link Belt Co., Indianapolis, Indiana, for charging the 48 x 42-inch Wheelabrator Tumblast and sorting mixed loads. The blast equipment is mounted on an I-beam platform so that work can be discharged directly upon a table in front of the operators who handle the sorting. Castings are trucked to the machine on the overhead level and empty directly into the Tumblast.

At one large foundry, one loader serves two 48 x 72-inch units. The loader is mounted on tracks so that it can be moved to either machine for loading while the other machine is being unloaded.



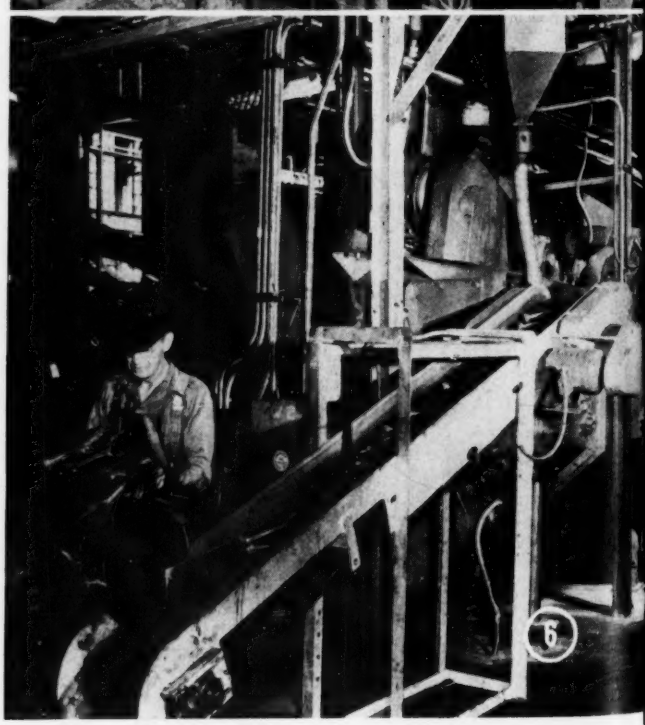
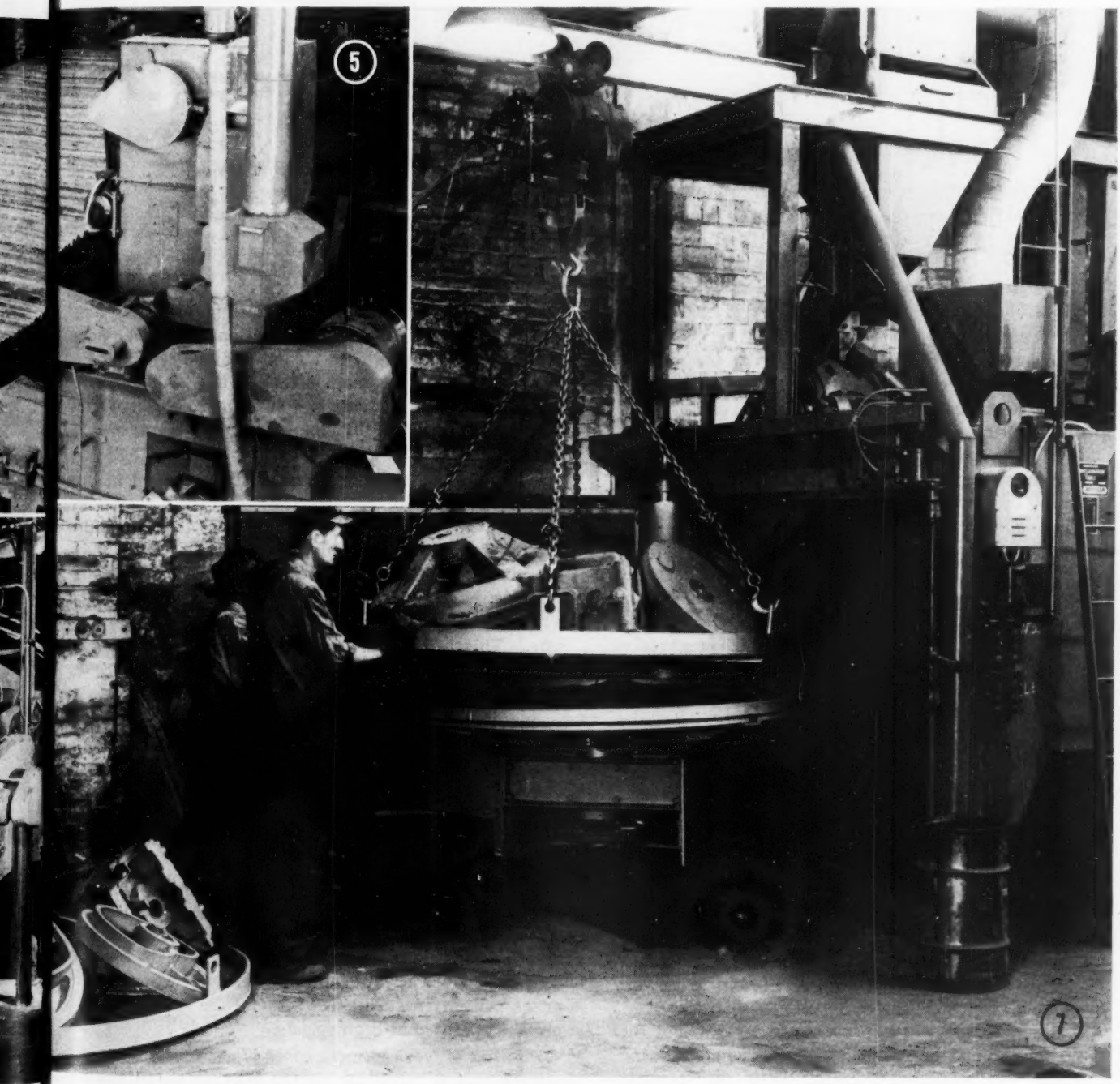


Fig. 4—Combination roller and monorail conveyor is used to handle railroad brake cylinders through the cabinet

Fig. 5—Method of handling locomotive boiler flues which are being cleaned in a specially-designed blast cleaning machine

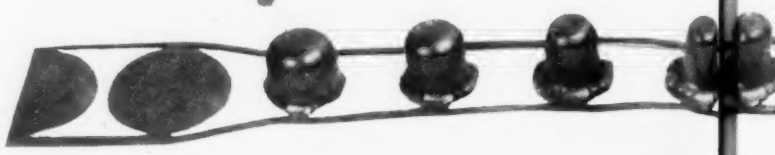
Fig. 6—Continuous cleaning automotive connecting rods

Fig. 7—Extra table top solves the problem of rapid loading of this Wheelabrator swing table



While there is no assurance that a progressive die will be efficient on all types of press work, a careful analysis of requirements can quickly estimate the possibilities of economic application

Progressive



...How To Appraise The Ap

By R. J. HARRIS
Die Engineer
Brandes Press Co.
Cleveland

WHAT will it cost and how long will it last? These questions seem the most outstanding ones when progressive dies are considered. In looking around for an answer the writer has come across some interesting facts that may be helpful in making progressive dies for automatic feed presses.

The product, of course, is what we are after; hence it is to be considered first. If it is to be a drawing die, it is very important to develop the various draws, and it is advisable to stay below the maximum draw in each station. It would be much cheaper and produce a better part to add an extra station then draw to the maximum. In the majority of cases stock is fed into the machine cold and during the progression of the various operations (depending of course upon the operation) material becomes heated, which in itself is helpful in following draws. In this type of die, various steels generally, and particularly zinc and alloys, will draw to better success when warm or hot. This is one of the advantages in progressive draw dies—other than the saving of handling and annealing between draws.

Stress should be placed on the fact that with variations in steels as to analysis and thickness, drawing conditions change, so allowance must be made for this variation.

What type of steel should be used for draw bushings? There are many types on the market, many of which will give very good results providing specified heat treatments are followed and the proper drawing compound is used. Many draw-bushings have been hard chromed 0.0005 to 0.001 per side to decrease wear. In extreme draws on very long runs, tungsten carbide has been used and found to be very economical.

Forming sections in a progressive die are not difficult but it must be remembered that when drawing, forming, piercing and blanking in a die, reservations must be made to replace or grind any station with the least amount of dismantling or disrupting of alignment. Weak blanking sections whenever possible should be made with an insert or placed in some other station where more strength is possible. Life of many forming sections has been increased especially in stainless steel by using a hard bronze which will eliminate pick-up.

Forming stations should always be arranged in the die in such a manner that they may be lowered to maintain alignment when grinding the top of blanking or piercing stations, or the blanking station may be raised the amount removed. Blanking or piercing sections have more life and produce better results when the die can be ground inside as well as outside. This is essential in lamination dies where the abrasive action of silicon steel wears down the cutting edge.

A new press known as the Brandes press has come forth with several innovations which are ideal to high production. Some of its outstanding features are air cylinders for counter-balance, continuous lubrication and a friction clutch which enables the operator to stop the press at any position of stroke, thus avoiding the miss-hits or double hits, thereby increasing die life. Wider die space is also an advantage in that it allows wider dies to be used and facilitates removal of die from the machine. The press is the inverted type with the crankshaft located below the bed to produce a low center of gravity which minimizes vibration ordinarily found in conventional presses operated at high speeds.

Piloting of work in most cases is necessary for good results as few machines on the market today can or do feed stock to a given pitch within less than 0.005-

ve Dies

The Applicability

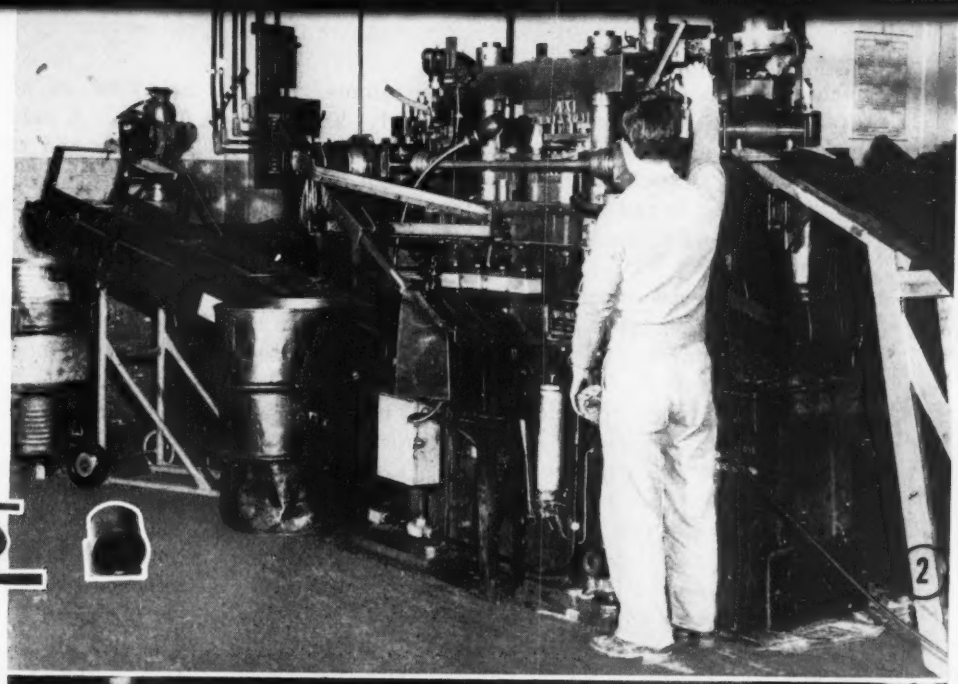


Fig. 1—This ferrule is made from 18-gage steel, 120 pieces per minute, on a 75-ton press using a two-section die involving eight operations—blanking, four draws, sizing, piercing and pinch trim

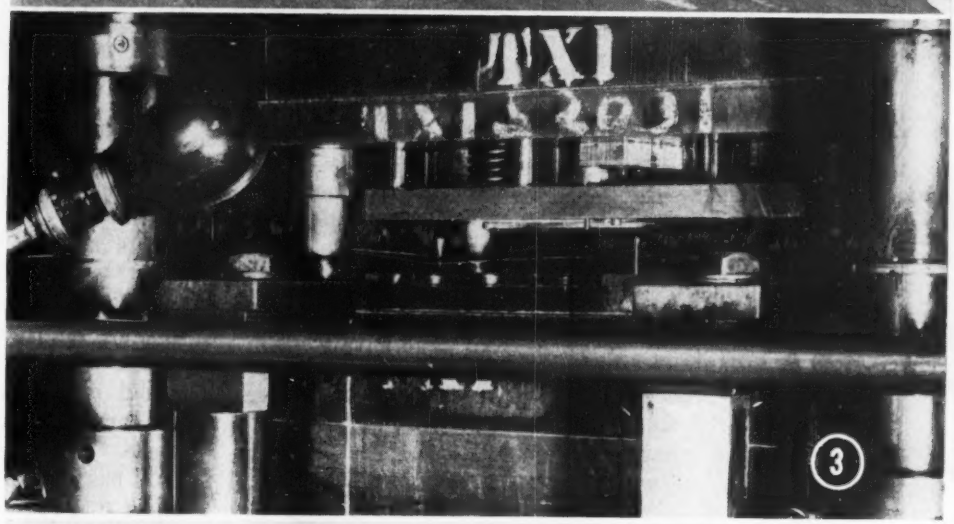


Fig. 2—This 60-ton Brandes automatic feed unit is typical of presses used in progressive die work

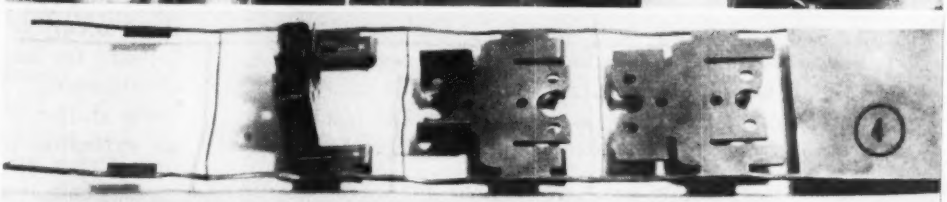


Fig. 3—Close up of press showing lifter designed to compensate for spring in steel; this feature prevents stock from catching on die edges

Fig. 4—View showing progressive die operations on a refrigerator-type lamp holder. Four steps—piercing, coining, forming and blanking—are required to turn out these pieces from 18-gage steel. Work is done on a 60-ton press using a four-section die at the rate of 110 pieces per minute

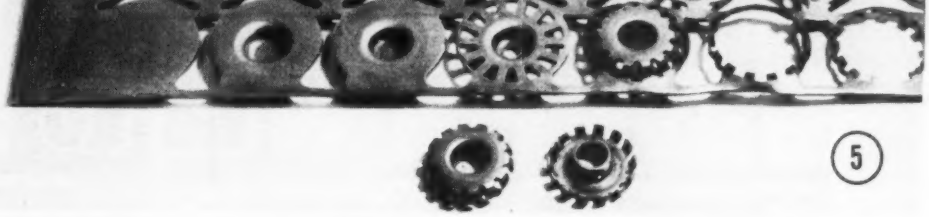


Fig. 5—Progressive operations on top section used in automatic sprinkler systems—made three per stroke on a 175-ton press using a five-station die providing piercing, two draws, forming and pinch-off trim. From 12-gage steel, the work is turned out at the rate of 240 individual pieces per minute

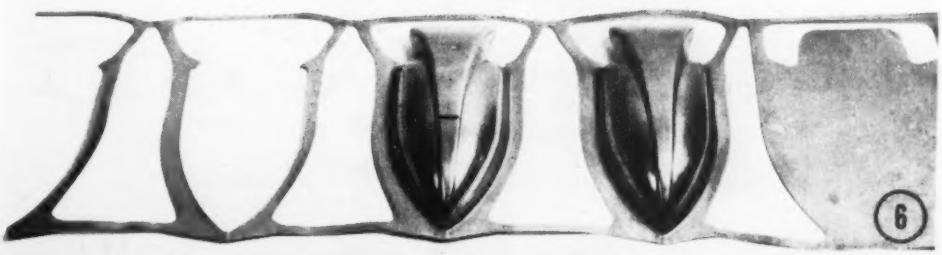


Fig. 6—Progressive die used for top of this toy iron also can be used for regular household electric iron simply by changing the insert. It is a four-station unit that blanks, draws, pierces, stencils and pinch trims. Material is 22-gage steel, work being done at the rate of 100 pieces per minute on a 75-ton press

inch at speeds over 100 revolutions per minute. Progressive dies when constructed properly and accurately can produce more parts at less cost than the conventional single operation die. Through 30 years of die making it has been found that in contemplating this type of die certain basic principles should be observed.

There is no assurance that a progressive die will be efficient on all types of work, but a careful analysis of the requirements—careful designing of die, selection of proper steel and a press of proper tonnage and simplified operation will prove that parts can be made in greater quantity and at a substantial saving in the cost per piece.

What quantity should die produce?—In determining whether a progressive die would be economical, it should be ascertained how many pieces are to be made. It would be impractical to make a costly die for a small number of pieces; not only would the initial cost be too great but set-up time, and removal of die from the press would consume more time than a saving accrued in a progressive die.

What type of material is to be used?—There is quite a difference between running steel, copper, aluminum, zinc and other metals and it should be remembered that there will be less die trouble if in developing the dies allowances are made. Some parts made of steel in a die will not work successfully in aluminum or brass without a change in the die. Progressive operations in one strip are apt to vary when broken down in to single operations.

It would be well to develop part in as near a condition in a single operation as will occur in the multiple operations. Since there are various drawing compounds on the market, it is a good idea to "develop" the drawing compound at the same time to determine which one will give the best possible performance.

What accuracy is needed for each part?—A progressive die cannot be too accurate in manufacturing; the closer the better, for nothing will cause more trouble than to have a variation in the pitch (distance from center of one station to the center of the next) or an accumulation of errors in a series of pitches. A part is no better than the die from which it comes and the material and accuracy with which it is made.

Have reservations been made for replacement of worn or broken parts of die?—Parts wear out and break, so construct the die so that parts may easily be replaced. In some dies where piercing occurs a quill punch may be used. It can be so arranged that a broken punch can be replaced without dismantling the entire die. Inserts can also simplify replacement in the event there is a breakage in a blanking station.

In some instances dies can also be made in individual units set together instead of being made as one piece. The advantage in this type of construction is that a unit which requires replacing may be removed and replaced without disturbing the remainder of the die.

Does the die have weak sections that are difficult and costly to replace?—By weak sections we mean blanking sections for which it is too difficult to make an insertion. It might be well in such a case to blank a part of the operation in a previous station where more strength is possible. In designing a progressive die it should be remembered that the die is no stronger, or will last no longer than its weakest station.

Has number of stations been reduced to a minimum?—The number of stations or operations in a die should be as compact as possible with the least amount of "blind" stations. An extra long die requires more time to start a coil, and too much time would be consumed to thread material through die to back rolls before automatic feeding could take place.

It has been the experience of the writer that in a short die, four or five stations where drawing operations occur, a blind station may be added to compensate for any variations in material or insufficient development. This allows for the addition of another draw station should necessity arise, without making an extension to the die. *(Please turn to Page* 104)

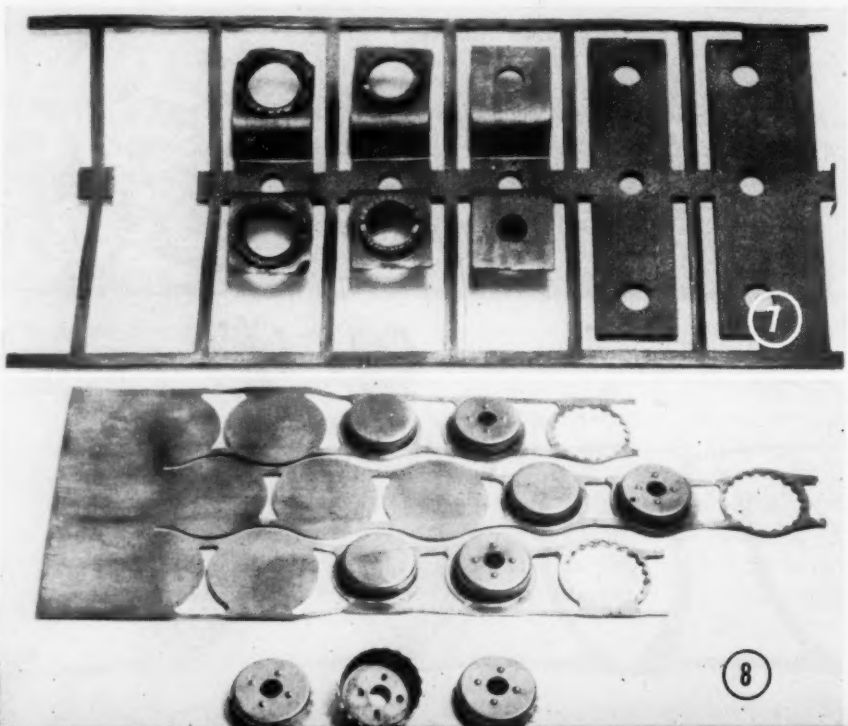


Fig. 7—*Bracket shown here is made* 100 *per minute on a* 60-*ton press involving five stations—piercing, forming, extruding, countersinking and blanking. A three-section die is used to turn work out from* 16-*gage steel*

Fig. 8 — *Four-station progressive die used to turn out this refrigerator part provides a perforating, drawing, strike-up, piercing and blanking operation on* 18-*gage steel. Work is done on a* 150-*ton press at the rate of* 80 *pieces per minute—three pieces per stroke*

Organic Finishes

For Metal Products

Selection and classification of organic finishing materials, primer coatings and their application, resin baking castings by induction heating are among the subjects covered in this section of the current series

ORGANIC finishes protect metal products by virtue of the interposition of a continuous, inert, and adherent film between the surface of the metal and its environment. Whereas, in the case of metallic finishes over metals the electrochemical relationships between environment, coating, and base metal play a predominant part in determining the efficacy of the coatings, such relationships, in general, play a relatively minor part in the field of organic finishes.

Instead, the factors that determine the degree to which the environment can be blocked off mechanically from reaction with the corrodible metal assume major importance. Another general feature of organic coatings, in contrast to metallic finishes, is the fact that the appearance of the finished metal product is completely transformed, practically any color or combination of colors, surface texture, or degree of gloss can be obtained with modern finishing materials, when properly selected and applied. Consequently, organic finishes are applied for decorative as well as protective purposes.

As in other fields of material development, the past few decades have witnessed in the field of organic coatings an evolution in scientific concepts and coordination which is remarkable in its scope and celerity. An increasing number of branches of science have exerted their influence in relating the composition of organic finishes to their structure. Researches in the field of organic polymers of high molecular weight have been particularly helpful in understanding the structure of the continuous phase of the finishing media.

It is generally recognized that the durability and service behavior of all organic coatings are, to a

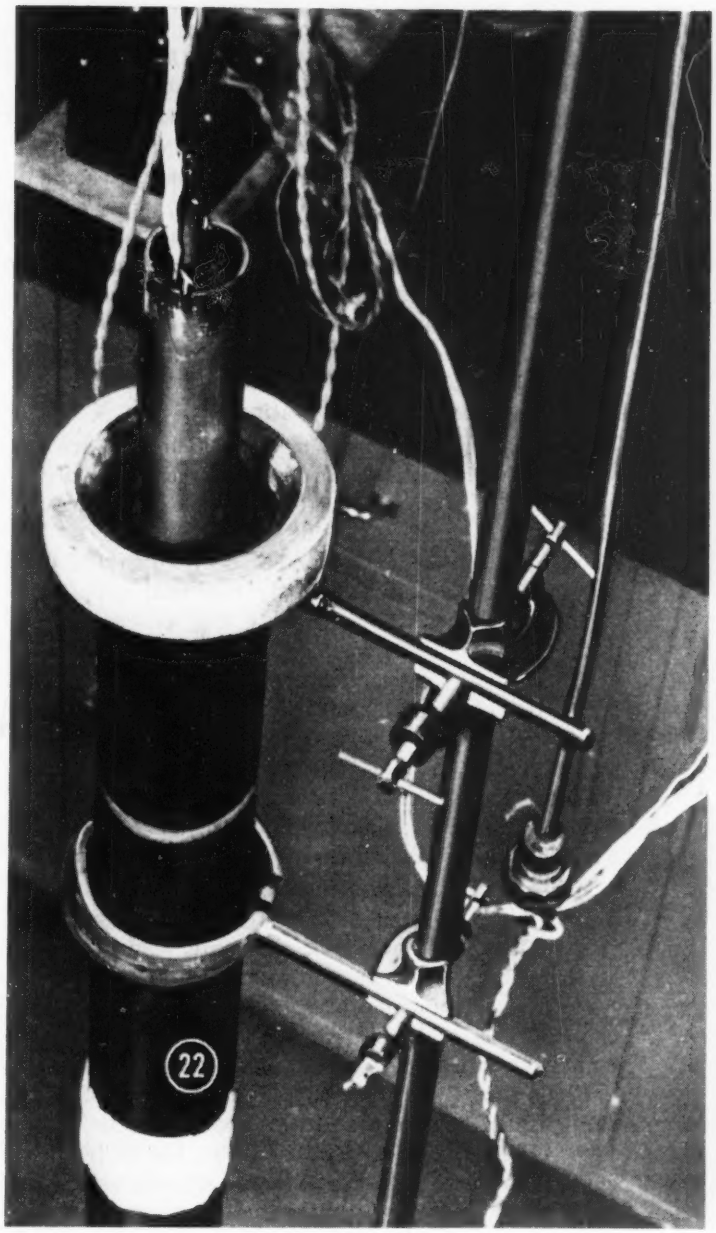
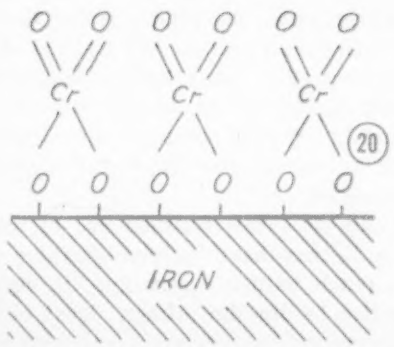


Fig. 20—Type of film formed when iron is passivated by chromates



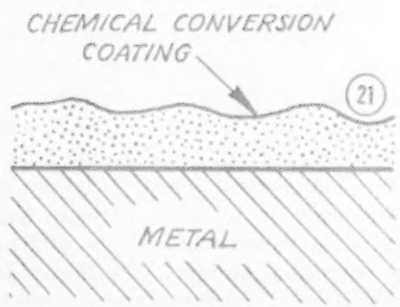


Fig. 21—Sketch of a corrosion product layer physically protective to the underlying metal

Fig. 22 — Steel pipe being coated inside and out in phenolic resin bath. Courtesy Bakelite Corp.

large extent, determined by the physical structure of the coating and to the manner in which the structure changes upon aging. As would be expected, this is dependent on the composition of the finishing material used, both the continuous phase, known as the vehicle, and the discontinuous phase, the pigment, contributing a determining part. Also, it should be recognized that the rate of change in structure of organic coatings on metal products, is in addition, influenced by environmental variables.

Primer Coatings—Organic coatings for metal products, thus, include a host of enamels, lacquers, and paints, which serve largely to isolate the metal from its environment. They are effective on metals, based to a large extent, on the effectiveness with which they limit diffusion of both moisture and oxygen.

Many modern organic finishes for metal products incorporate corrosion inhibitors in the paint coating next to the metal, which coating is known as a primer coating. The application of primers serves to provide some protection against corrosion, and to foster adequate adhesion to the base metal The inhibitors they contain serve to limit attack of the metal by any corrosive compounds, that succeed in reaching the metal, through the organic coating.

Some common examples of such inhibitors are red lead and zinc chromate, both of which are only slightly soluble in water, yet sufficiently so, to bring adequate concentration of the inhibiting ions to the metal surface, where they act to diminish the rate of reaction. Inhibitors of the red lead type have been termed passivators, because they passivate iron, recognized by a more noble potential of the metal in contact with their aqueous solutions. The increased noble potential distinguishes the passivators as a group among the inhibitors.[34] Shown in Fig. 20, is a representation of the type of film formed when iron is passivated with chromates; this is contrasted with the protective chemical conversion coating layer, Fig. 21, which was discussed in a preceding section.[35]

Most modern primers contain a corrosion-inhibiting pigment, or combination of pigments. Some of the pigments used are: Zinc chromate, lead chromate, combination of zinc dust and zinc oxide and certain basic lead compounds. It is the general practice that combinations of inhibitive pigments are more widely employed than formulas containing only one pigment.

Tests show that to secure adequate protection the zinc chromate content and specification of the primer must be held within definite limits; the presence of small concentrations of chloride or sulphate have been found to reduce greatly the effectiveness of zinc chromate, as a primer coating pigmenting material. Other pigments are sometimes used in conjunction with zinc chromate in the primer composition.[36]

Present day trend to rapid finishing schedules has led to the development of numerous formulations based on synthetic resins. Thus, red lead in linseed, a common primer material of a few years ago, is being used in combination with the faster drying alkyd resin vehicles; zinc chromate is frequently used in combination with alkyd-phenolic vehicles. On metal products which will be wet frequently, or which will be exposed to industrial fumes, the corrosion inhibiting zinc chromate type primer is generally used with either an alkyd or phenolic vehicle or a mixture of the two.[37]

Fig. 23—Heating rate curves for phenolic resin coated steel pipe, showing comparison of time required to bake the coated pipe in a ventilated oven vs induction heating

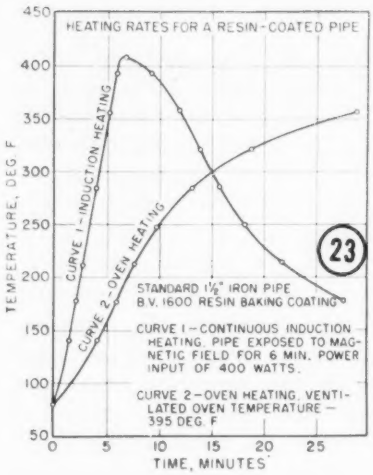

HEATING RATES FOR A RESIN-COATED PIPE
TEMPERATURE, DEG F
TIME, MINUTES
CURVE 1 - INDUCTION HEATING
CURVE 2 - OVEN HEATING
STANDARD 1½" IRON PIPE
B.V. 1600 RESIN BAKING COATING
CURVE 1 - CONTINUOUS INDUCTION HEATING. PIPE EXPOSED TO MAGNETIC FIELD FOR 6 MIN. POWER INPUT OF 400 WATTS.
CURVE 2 - OVEN HEATING. VENTILATED OVEN TEMPERATURE - 395 DEG. F
23

Fig. 24—Diagram of induction baking unit for continuous coating of steel pipe. Courtesy Bakelite Corp.

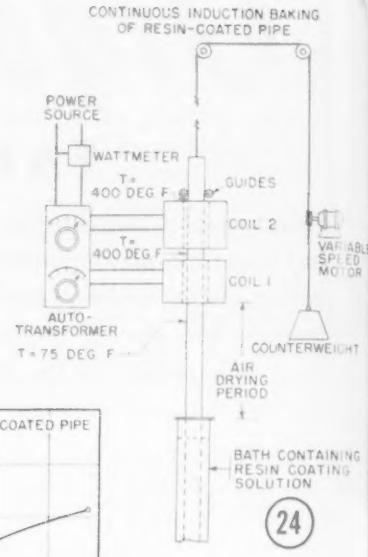
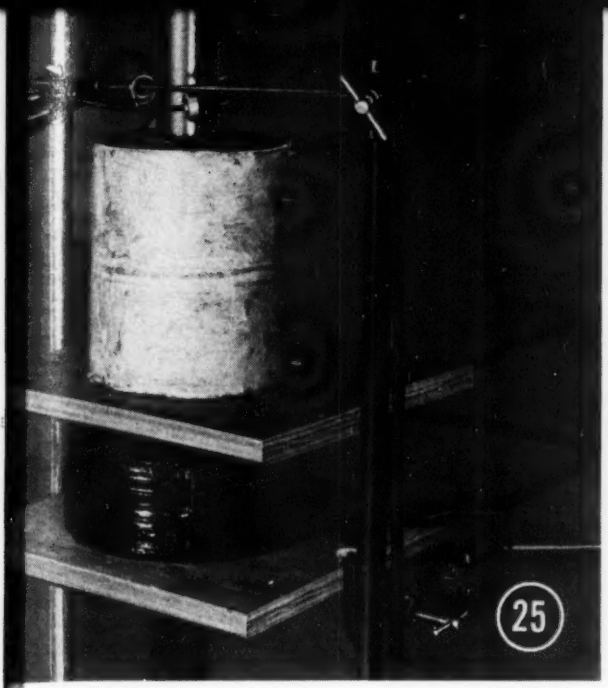


Fig. 25 — Coated pipe passing through heating coils. Courtesy Bakelite Corp.

The more reactive metals, aluminum, magnesium, and zinc, usually require zinc chromate primers. Lead-pigmented primers should not be used on aluminum.[38] However, there are other primers with excellent performance records when used on iron and steel products, such primers may contain red lead, basic lead pigments and sometimes, zinc dust. Aluminum pigments have been found to provide special film properties which depend on the flake structure of the pigment, and they are used extensively on many types of metal products.

Application of Primer—In the finishing of metal products the fact should be kept in mind that a primer film does not necessarily have to be a thick film, but it should be a continuous one. In most cases, a dry film thickness of one-half to three-quarters of a mil will suffice. Since the primer is the foundation of the entire finishing system, the method of application is important. Too many times the primer is applied carelessly leaving parts of the surface untouched or scantily covered because the operator thinks it will not be visible after the metal object has been completely coated.

If the metal objects being finished are of an intricate shape, or if they have interior surfaces that are difficult to reach with a spray gun, it may be a desirable practice to dip the primer. Most objects



can be dipped, provided they are not too large, and do not contain depressions or pockets that will trap the paint. The dipped objects should be hung so the excess paint flows toward a given point or edge. A study of the contour of the part will generally reveal a way to suspend it that will insure the optimum flow. Once established, the direction of flow should not be changed, since sags will result if the film is caused to reflow over itself after it is partly set up.

One reason primer coatings are used on metal products is that it is often impossible to build into a single coat all of the properties that are desired in a finish. Primers, as has been pointed out, are designed to give the maximum of adhesion to the surfaces on which they are applied, to provide the maximum of corrosion resistance, and, in some cases, to seal or fill any pores or other imperfections, in the surface of the metal.

Thus, as has been brought out, most primers contain corrosion-inhibiting pigments, such as zinc chromate and red lead, which immediately limit the range of possible colors to those which will tolerate considerable quantities of the yellow, red and orange shades of these pigments. Furthermore, in the interests of adhesion of the final film, it is desirable to have low pigmentation and high binder solids, a combination which is not conducive to one-coat hiding, particularly in the case of white, ivory, or pastel colors. Frequently, the vehicles that provide the best adhesion and corrosion resistance are not the best for color retention and production of lasting gloss, or they may be so dark in color, or have such a high staining power that the colors obtained are muddy and unattractive. Thus it can be seen that a one-coat finish must be a compromise between adhesion and corrosion resistance on the one hand, and decorative effects on the other. There are many cases where such a compromise may work out entirely satisfactory. However, with a good primer, properly applied next to the base metal, there is a much wider choice of decorative top coats without adhesion and corrosion problems.

For metal furniture and fixtures, instruments and machinery which are to be used where there are no serious corrosion problems, surface coatings may be comparatively simple, one or two-coat systems. Most of these are baked, or are fast-drying lacquers. Many special finishes such as wrinkle coatings, may be employed for decorative effects.

When metals are to be used under more corrosive atmospheres, or subjected to galvanic or electrolytic corrosion, more elaborate finishing systems are necessary. Such systems will usually include: (1) Passivation of the surface by chemical pretreatment; (2) use of primers containing inhibitive pigments; and (3) sealing the surface with an impervious coating. Under such conditions, it must also be recognized that the top coating also has a secondary function of providing the desired decorative effect which may add to the sales appeal of the article.

TABLE III
CHARACTERISTICS OF PHENOLIC RESINS USED IN MODERN COATINGS

TYPE OF RESIN	QUALITIES IMPARTED TO COATING	GENERAL USES
100 Per Cent Phenolic Resins	Resins in this group offer wide adaptability in manufacture of the coating and in its use. They offer utmost durability, chemical resistance, toughness, lasting flexibility, marproofness, electrical resistance, abrasion resistance, moisture resistance. Used in paints, varnishes and enamels, they also offer faster drying.	For use on industrial or marine structures, or wherever extreme conditions of corrosion or weathering must be faced. For floors and other surfaces receiving hard wear. For industrial air-drying or baking coatings.
Oil Extended Phenolic Resins	These resins provide excellent adhesion and tough, flexible baking coatings where light colors are not important. Baked films resist several hours in boiling water; alcohol and many chemicals.	Used for baking primers and enamels; also for fortifying cellulose lacquer and asphaltic-type coatings.
Phenolic Dispersion Resins	Non-oxidizing resins which dry entirely by solvent evaporation to handle or recoat in 5 minutes or less. Excellent adhesion to all metals with high durability and resistance to moisture, retention of flexibility on aging, compatibility with other film-forming ingredients, non-penetration on porous structures.	Drying time controlled by evaporation rate of solvents. Shop coats for steel, aircraft primers and top coats, caulking compounds, non-skid floor coatings, traffic paints, touch-up primers, sealing solutions for wallboard, concrete, wood and paper.
Phenolic Lacquer Resins	Compatible with nitrocellulose and in some cases with the vinyl resins. Films dry to great depth of luster without polishing, offer excellent resistance to alkalies, acids, water and grease, with good color retention and are extremely tough and durable with freedom from cold checking on aging.	For metal, wood and furniture finishes, particularly where hard wear, exposure to alcohol and cleansing agents present a problem.
Phenolic Resin Baking Types	High resistance to acids, water and solvents, including acetone and salt spray. Good color, excellent hardness and abrasion resistance. Flexibility and adhesion vary, depending on resin. These resins are applied by spray or dipping and must be baked to develop their maximum resistance to solvents, chemicals and moisture.	For steel piping and all types of industrial equipment, rigid and flexible, particularly in the chemicals, food, and marine fields. In addition to small articles, baked in standard ovens, large structures such as ship holds can now have the advantages of these baking finishes through special portable baking equipment.

Courtesy Bakelite Corp.

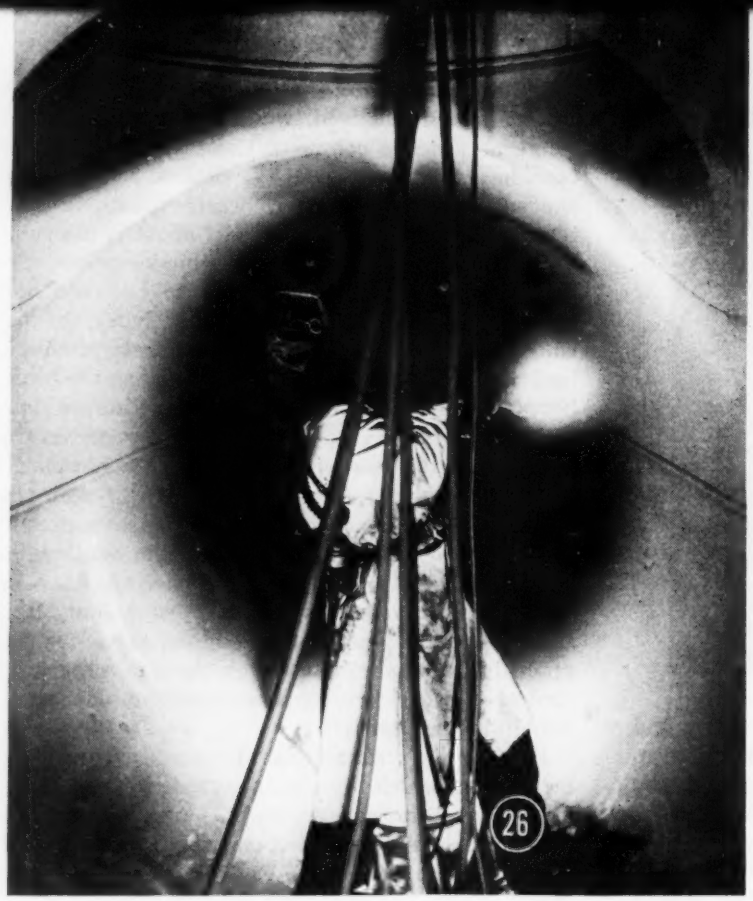


Fig. 26—Preparation of interior surface of a welded steel tank car to receive a phenolic resin coating by sandblasting. Courtesy Bakelite Corp.

Classification of Organic Finishing Materials — Present day trend to rapid finishing schedules, whether by air drying or baking, has led to the development of numerous formulations based on synthetic resins. Although there are literally hundreds of polymerized and polymerizable materials that fall under the heading of synthetic resins, suitable for certain coating applications, they may be classified under two main headings. These are the thermosetting, or heat hardening types, on the one hand and the thermoplastic, or heat and pressure softenable materials on the other. A few materials are borderline cases, acting as members of both groups. The thermoplastic materials are as a rule completely polymerized as made, and are deposited from solution or suspension without involving further chemical change being involved. The thermosetting products are used in a partially converted condition, the final curing to an insoluble, infusible, corrosion-resistant film being obtained after application by baking.

Phenolic Resin Coatings — The oldest member of the thermosetting group is the condensation products of phenols and formaldehyde to give the amine-aldehyde group of resin-baking coatings. When this reaction is carried to its limit, an insoluble, infusible resin results, which is very useful as a structural material, but not as a coating. The reaction can be interrupted, however, at a point where the resin is soluble in alcohol and this can be applied to a surface on which the final conversion can be achieved.

This converted film rates very highly, in regard to corrosion resistance, against a wide variety of chemicals. Because they dry to a greater extent by polymerization, than by oxidation, and because of other advantages inherent in phenolic resins, formulations are possible for coatings which exhibit toughness, durability, chemical inertness, water resistance, corrosion resistance, flexibility, adhesion and speed in drying. When unmodified, these thermosetting resin baking finishes yield hard, glossy abrasion resistant films which exhibit excellent electrical properties. Resistance to strong alkalies, however, is poor.

These oil-free thermosetting phenol-aldehyde resins are supplied to the paint and varnish industry generally as solutions of the resin in alcohol type solvents, which require further dilution before application. Table III, prepared by the Bakelite Corp., is a summary of the characteristics of the phenolic resin used in modern coatings. Many varieties of these phenolic resin solutions are available, their compositions designed to meet specific coating requirements. They may be pigmented or dyed, as required, by the coatings manufacturer.

The varied industrial coating uses of these resins are the result of the utilization of the following principal properties.[39] A. Resistance to moisture, perspiration, and a long list of solvents, acids, and other chemical corrosives. B. Their good retention of film integrity either in prolonged atmospheric weathering or in the corrosive atmospheres encountered in industrial applications. C. Good electrical insulating properties. D. Ability to withstand occasional periods of exposure to heat, even as high as 600 to 700° F. E. Hardness and abrasion resistance. F. Variations possible in composition and also through plasticizing to meet varied requirements.

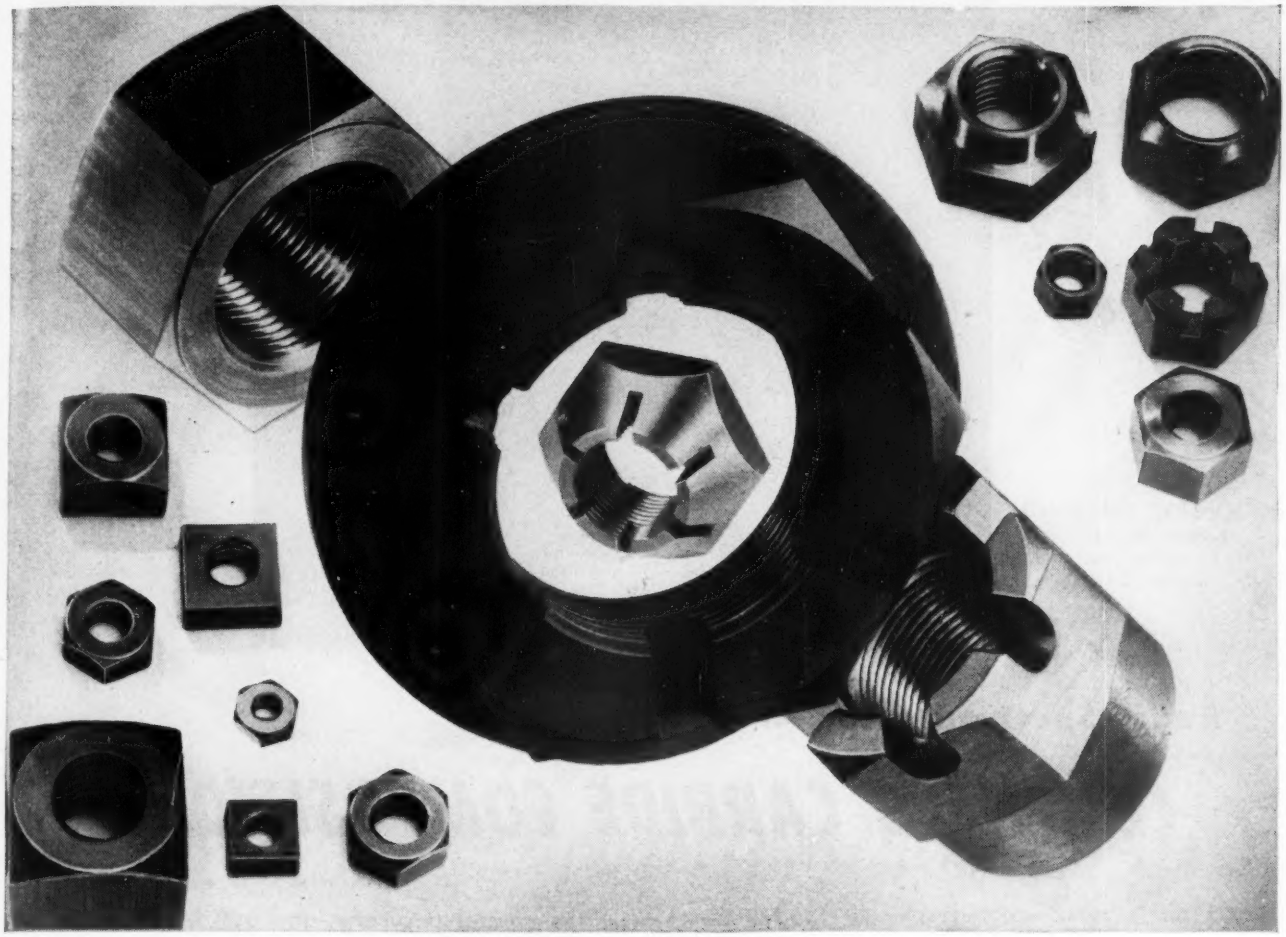
Properties listed under (A) and (B) were utilized as early as 30 years ago[39] in the protection of brass beds against tarnish. This use led to the finishing of brass and other metals for vanity cases, ash trays, scientific instruments and various articles of hardware. The experience gained in these early uses led to their wide adoption as protective coatings for containers. Drums, tanks, tank cars, vats and a variety of equipment in the chemical processing industries were successfully protected.

Their inert qualities extended the field of usefulness in equipment and containers for water and foodstuffs; milk, beer, wine, sea foods, etc. In this application, not only was their resistance to corrosion utilized but the hard, glass-like surface which resulted, facilitated the cleaning of tanks and other containers. This smooth surface prevented the slime from taking hold, thus reducing bacterial and fungicidal organisms, and allowing simplified cleaning with hot water and steam for sterilization. Where required, acid and alkaline cleaning materials could be used without affecting the surface.

Table IV gives the electrical properties of the phenolaldehyde resin baking coatings. These values alone and in combination with the resistance properties listed in (A) have resulted in the use of these coatings on electrical equipment such as rectifiers, low voltage transformers, conduits and wire wound resistors. Also on steel parts adjacent to storage batteries and electrolytic equipment and on a variety of electroplating equipment.

Properties listed under (D), the

(*Please turn to Page* 100)



IT'S "t.f.e."

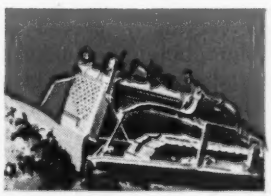
TO SPECIFY A BRAND OF *KNOWN* DEPENDABILITY

The only thing you can gain by buying nuts on "price" alone is an *illusion* of saving. When you buy on the basis of *total* fastening cost, your *actual* savings far exceed the amount of an imagined one.

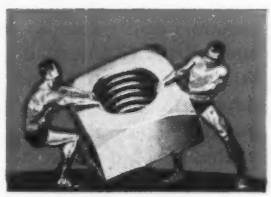
RB&W builds into nuts (and other fasteners) the "know-how" from 103 years of fastener experience, developments of an outstanding research staff, and the benefits of the most modern machinery. This means substantial savings to you in time, money and dependability.

In addition, RB&W's quality control over production assures that *each* nut (bolt, screw, rivet or special) is fully capable of playing its part in *T*rue *F*astener *E*conomy.

TIME—Holes repunched clean and true—tapped in latest-design tappers—insure accurate and uniform thread formation for quick run-on.



MONEY—Cold-working of the metal also increases its density for greater load-carrying—maximum holding per dollar of initial cost.



DEPENDABILITY—The RB&W cold-punching process in itself insures a sound product, free from structural defect.

t.f.e.
TRUE FASTENER ECONOMY
IS THE LOWEST TOTAL OF ALL
FASTENING COSTS

RUSSELL, BURDSALL & WARD
BOLT AND NUT COMPANY

BOLTS · NUTS · SCREWS · RIVETS
RB&W
THE COMPLETE QUALITY LINE
& ALLIED FASTENING PRODUCTS

Plants at: Port Chester, N. Y., Coraopolis, Pa., Rock Falls, Ill., Los Angeles, Calif. Additional sales offices at: Philadelphia, Detroit, Chicago, Chattanooga, Oakland, Portland, Seattle. Distributors from coast to coast.

103 Years Making Strong the Things That Make America Strong

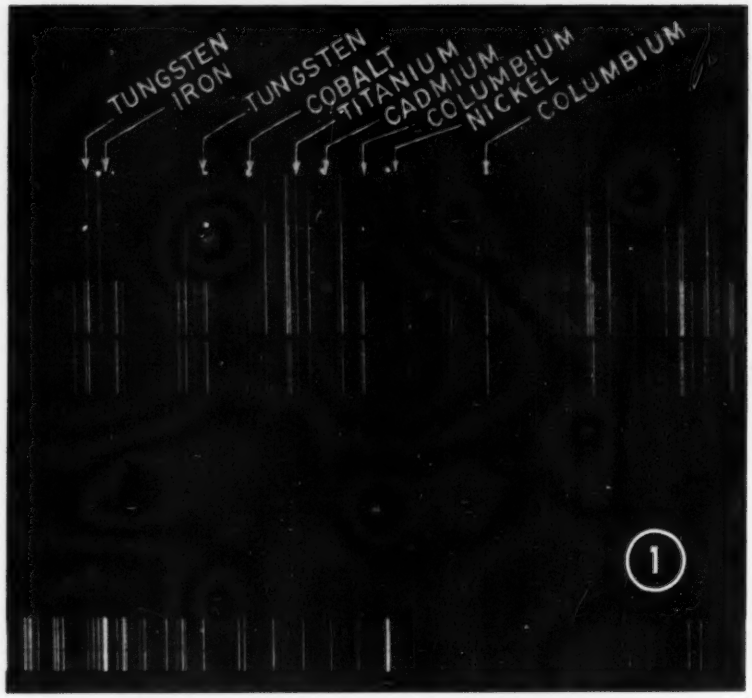


Fig. 1 — Typical carbide moving plate which covers range from about 3000 to 3150 angstrom units for 8 minutes. Last spectrum is an iron standard

By JOHN C. REDMOND
Research Engineer
Kennametal Inc.
Latrobe, Pa.

Rapid Spectrographic Analysis of

CEMENTED CARBIDE COMPOSITIONS

Technique provides greater accuracy, and acts as an excellent guide to the wet chemical procedure

NEED for a rapid spectrographic analysis of cemented carbide compositions is readily apparent to any one who has attempted a wet chemical determination. Separations of the elements encountered are some of the most tedious and time-consuming in the field of metal analysis, a complete run requiring about 4 days. Present in cemented carbide compositions are mainly tungsten, carbon and cobalt and varying amounts of titanium, columbium, tantalum, iron, nickel and molybdenum. Separations of most of these elements are not clear cut, requiring repeated precipitations.

Unfortunately, difficulties are not absent in their spectrographic analysis. The wide percentage range of constituents, their complex spectra and varying excitabilities result in a complicated spectrographic problem.

In general, the percentage of cobalt, titanium, columbium, and tantalum varies according to the application of the carbide and the percentage of iron, nickel, molybdenum and some others according to the degree of purity or contamination during processing. In the case of the former, 12 per cent was set as the upper limit to encompass the large majority of carbides although occasionally some contain higher percentages and a maximum of 2 per cent for the impurities.

Methods Investigated—The various methods investigated before we settled on our present method may prove of interest. Due to the diversity of sample sizes and shapes, it was thought advisable to first reduce them to powders. Briquetting, with the use of a suitable binding agent, proved unsuccessful mainly because of difficulties in obtaining homogeniety and uniform compactness. A solution method was erratic, with the lines of some elements almost lost completely.

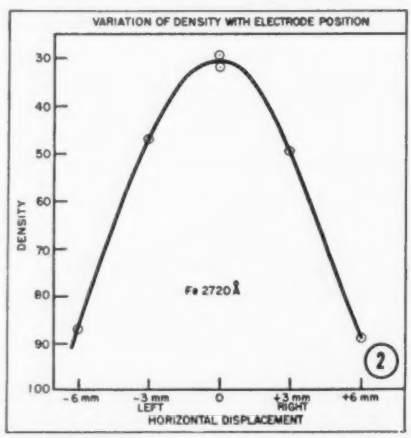


Fig. 2—Variation of density with electrode position. Densities of several iron lines measured and plotted against displacement shown

Common direct current arcing methods, using the powder in a crater electrode, is good for qualitative work. However, it fails for quantitative determinations largely because of the refractory nature of most of the metals involved. Using a small sample (10 milligrams) and high current (9 amperes) some element lines persist after as long as 12 minutes burning time. This is shown plainly by moving plate studies in which the total burning time instead of being integrated is divided into increments of 1 minute by means of racking of the plate. A typical carbide moving plate is shown in Fig. 1. This covers the range from about 3000 angstrom units to 3150 angstrom units for 8 minutes, the last spectrum being an iron standard This is only a small part of the plate yet notice the large number of lines appearing. Tungsten, columbium and titanium lines can be seen, still present at the end of the run. Another interesting feature is the relative speed in which cobalt, iron and nickel, the lower boiling elements, are removed, similar to a fractional distillation furnace.

Influence of Thorium Oxide—Mod-

CMP THINSTEEL
TRADE MARK

Spring IS HERE TO STAY

Because of its consistent precision characteristics, CMP carbon and alloy spring steel offers important advantages to both your production operations and your finished product. CMP pioneered precision strip processing techniques and has maintained leadership in rolling and annealing advancements that assures unvarying accuracy to all specifications in coil after coil. It makes certain that you can always achieve the *spring you want* when CMP Thinsteel is specified. Let CMP experts help you with your spring steel problems. Phone or write today.

THINSTEEL *Spring Steel* FACTS

Chemistry is held within proper range for best heat treatment response.

Width and gauge are accurate to closest tolerances.

Annealing is controlled for the ideal spheroidization.

Decarburization is held to the absolute minimum.

Physicals are uniform throughout every shipment.

CMP STRIP STEEL — PRECISION COLD ROLLED

the Cold Metal Products co.

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TABLE I
OPERATING CONDITIONS FOR SPECTROGRAPHIC ANALYSIS

Spectrograph Settings	Hilger Large Quartz Prism 10 u Slit 2450-3500 Angstrom
Source Settings	A. R. L. Multisource 5 mfd., 100 mh., 0.4 ohm
Photographic Plates Processing	Spectrum Analysis No. 1, D-19, 2¾ Min., 64° F
Calculations	Internal Standard Method
Sample	30 mg. + 30 mg. Carbon
Exposure	2 Min., 50%
Electrodes	"Center Post" Crater

TABLE II
COMPARISON OF SPECTRO TO CHEMICAL RESULTS

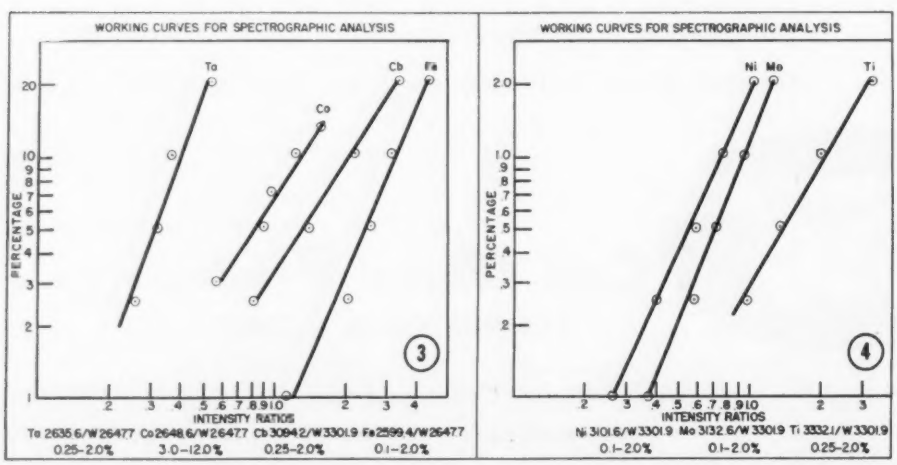
			Co	Ti	Ta	Cb	Fe
Simple Carbides	D-93	Chem.	3.60%	0.47%	0.84%	0.78%	0.64%
		Spectro	3.8	.53	.72	.74	.55
	D-94	Chem.	5.38	1.81	.42	.31	.84
		Spectro	5.7	1.90	.47	.36	.88
	D-96	Chem.	9.57	.51	1.69	.95	.94
		Spectro	10.4	.55	1.77	1.07	.98
	B-5	Chem.	8.02	4.41	1.75	1.53	.67
		Spectro	7.2	4.0	1.7	2.0	.50
Complex Carbides	D-217	Chem.	10.72	7.30	2.89	3.02	.68
		Spectro	10.3	6.4	3.0	3.2	.82
	#350	Chem.	11.30	6.68	2.06	2.44	1.14
		Spectro	11.5	7.2	2.6	2.0	.95

erate success was obtained by using thorium oxide as an added internal standard and was used for some time. This technique was limited by the variations in overall spectral intensities or absolute densities, apparently caused by arc wandering. To study the effect of this arc wandering, small diameter, pointed iron electrodes were arced at horizontally varied positions. The densities of several iron lines were measured and plotted against displacement as shown by Fig. 2. The vertical axis is the absolute density of the iron line at 2720 angstrom units and the horizontal axis is the position of the electrodes. It can readily be seen that for good overall density reproducibility, the arc should be confined to 1 millimeter on either side. This condition is probably aggravated by our narrow slit width, which by necessity must be used.

In our present method we largely surmount the foregoing sources of error by the use of a stable spark-like discharge. In order to use this type source on powders, it is necessary that the sample be ground to a very fine state for complete removal from the electrode. To do this on these very hard materials we employ a carbide mortar and pestle. A little practice is required to ensure a uniform degree of fineness from time to time. Particle size measurements of these powders, by means of the air permeability method, show an average diameter of 1-2 microns. Table I lists our operating conditions. Note the narrow slit width necessary for good resolution of the lines. The source settings are those of the manufacturer. The long exposure time is necessary to bring out the rather weak lines of tantalum.

Two series of standards were made. The first with low titanium, tantalum and columbium, all up to 2 per cent, for the analysis of the straight WC-Co compositions. The second with higher titanium, tantalum and columbium, from 0.5 to 5 per cent, to cover the range of the more complex carbide-cobalt compositions. These underwent all the processes generally used in the manufacture of carbides.

Figs. 3 and 4—Working curves for spectrographic analysis of straight WC-Co types



The physical and metallurgical condition of the sample has a marked effect on the position of the working curves. An unheated mix does not act the same as its sintered product, although the constituents in each are present in like chemical combinations.

Figs. 3 and 4 show some of our working curves for the straight WC-Co type. Not listed but used for complex types are the titanium line at 3309.5 angstrom units for the range of 1.5 to 12.0 per cent and the columbium line at 3145.4 angstrom units for the range of 1.0 to 5.0 per cent. These are both used with the same tungsten standard line 3301.9 angstrom units.

Results Obtained—Some results we obtained as compared to the wet chemical figures are shown in Table II. The chemical figures are the result of several runs whereas the spectro results are one ordinary run. As could be expected, the accuracy for the WC-Co compositions is considerably greater than for the more complex types, which in the case of the former is in the order of 15 per cent of the amount present, while in the latter is somewhat higher.

Fortunately, in our laboratory wet chemical cobalt and carbon determinations are both only a matter of a few minutes and can be combined with spectrographic results for the other constituents to give a rapid complete analysis. In the case of the straight WC-Co grades, this is generally quite satisfactory. For many applications, this procedure for the complex type is also satisfactory and when greater accuracy is desired, it is informative and acts as a very good guide to the wet chemical analysis.

This type analysis can probably be applied to materials other than carbides as long as they are very fine powders or are first reduced to that state. As a matter of fact we use it in our laboratory with good results to check the purity of tungsten powders as received.

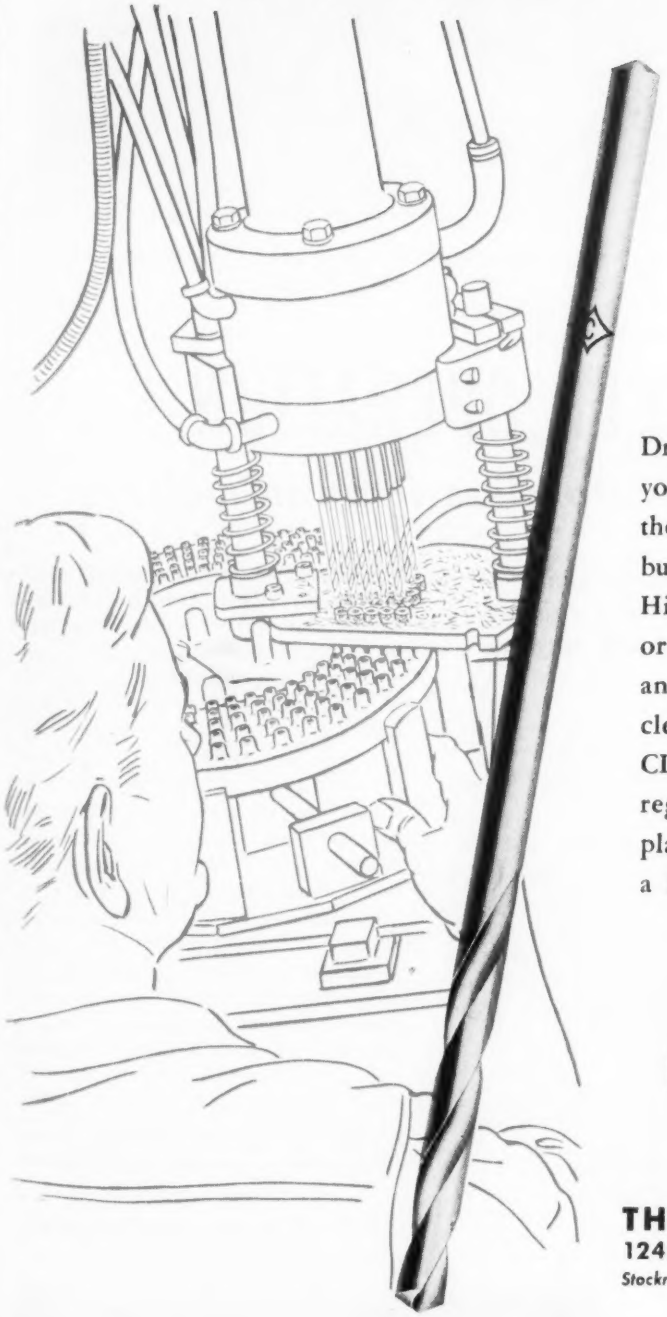
Contractors Form Metallizing Association

First general meeting of American Metallizing Contractors Association, St. Louis, was held recently in Cleveland. Fourteen of the largest contract shops in the metallizing industry were responsible for organization of the group.

W. C. Reid, actively engaged in promotion and development of the process in the United States for the past 20 years, was elected to honorary membership and will serve as consultant for the group.

CLE-FORGE HIGH SPEED DRILLS PRODUCE

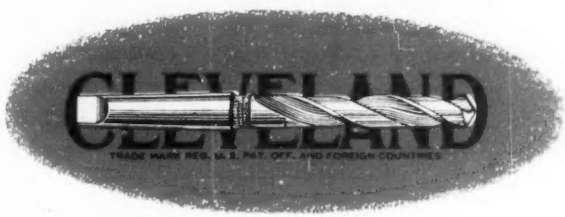
1,469 MORE HOLES PER GRIND



Typical Results of an Actual Test on *Stock Drills*

Drilling cast iron burners can be a problem—unless you use CLE-FORGE High Speed Drills. On the production job shown here, four makes of stove burner drills were carefully tested. CLE-FORGE High Speed Drills gave 3,466 holes per grind, or 1,469 more than the next best! This is not an unusual record. It is typical of many tests, and clearly demonstrates the superior performance of CLE-FORGE High Speed Drills. For information regarding a survey of drilling operations in your plant, write or call our nearest Stockroom to send a Service Representative, or . . .

Telephone Your Industrial Supply Distributor.



THE CLEVELAND TWIST DRILL CO.
1242 East 49th Street **Cleveland 14, Ohio**
Stockrooms: New York 7 • Detroit 2 • Chicago 6 • Dallas 1 • San Francisco 5
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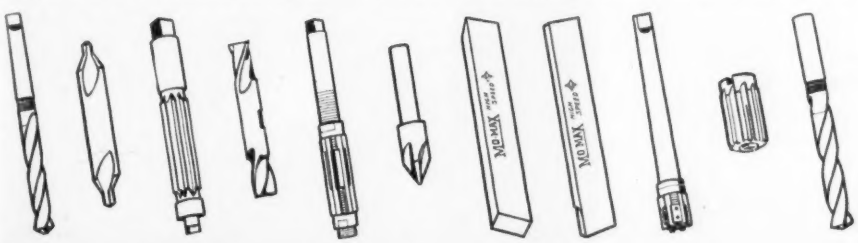
ASK YOUR INDUSTRIAL SUPPLY DISTRIBUTOR FOR THESE AND OTHER CLEVELAND TOOLS



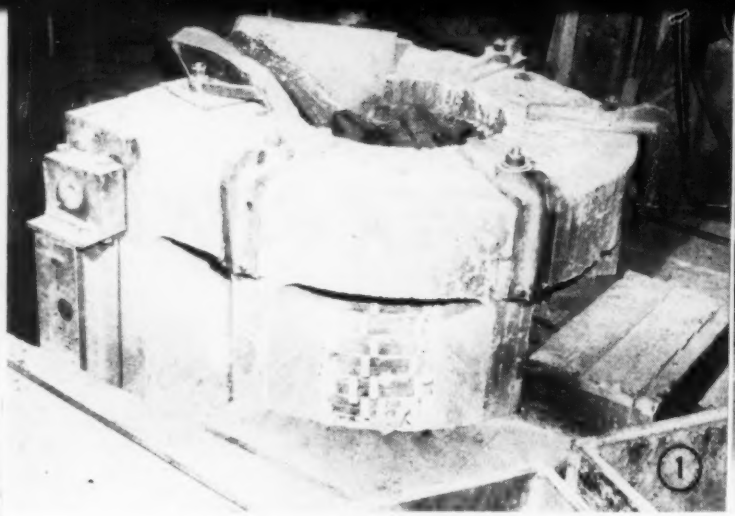


Fig. 1—View of 5000-pound induction furnace showing charge of heavy tube crop ends

Fig. 2—Pouring melt from induction furnace into transfer ladle

DUPLEXING STEEL OPERATION

—affords greater use of stainless scrap in melt

Combination of high-frequency and arc furnace melting is used to absorb excessive amounts of tube mill revert stainless material. Up to 60-per cent chromium-nickel scrap may be utilized with this process

By DAN REEBEL
Associate Editor, STEEL
Photography by Author

ECONOMIC utilization of high percentages of stainless steel scrap in melting of low carbon, high quality, chromium-nickel stainless steels at Babcock & Wilcox Tube Co., Beaver Falls, Pa., has been greatly facilitated by the development of a duplexing operation whereby high frequency induction melting and arc furnace melting is combined. The process enables them to use up to 60 per cent chromium-nickel stainless scrap in the production of tube billet quality 0.07 and 0.08 maximum carbon stainless in such grades as 304, 310, 316, 317, and 347. The need for such practice in this plant is quite vital to their operations, inasmuch as entire ingot tonnage is processed to seamless tubing in the above grades and yields as low as 50 per cent from ingot to finished tube are not infrequent.

Lighter types of scrap generated in the conversion process are used directly in the arc furnace while the heavier types, such as bloom crops and bar crops are melted down in 5000-pound high frequency induction furnaces and ladled to the arc furnace during the working of the heat. Extremely high recoveries of chromium are being realized by this process in addition to the added feature of creating turbulance or a good "stirring action" by the addition of the metal near the end of the heat which in turn has improved

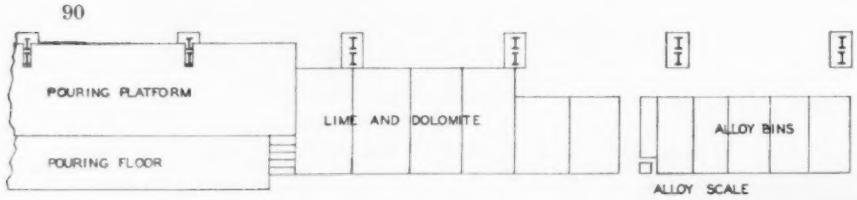
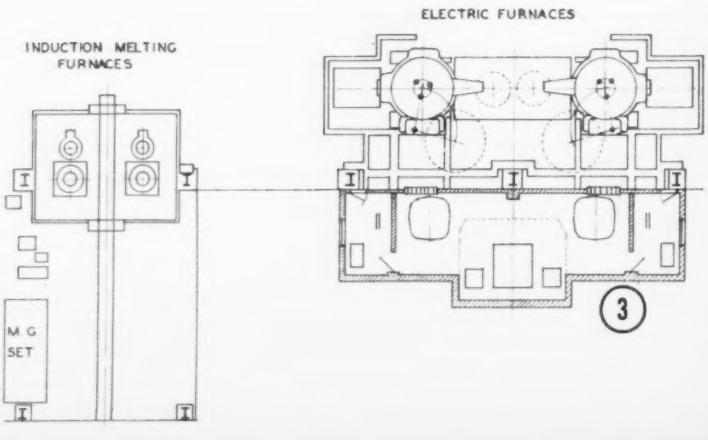


Fig. 3—Lay-out of melting department showing placement of induction and arc furnaces



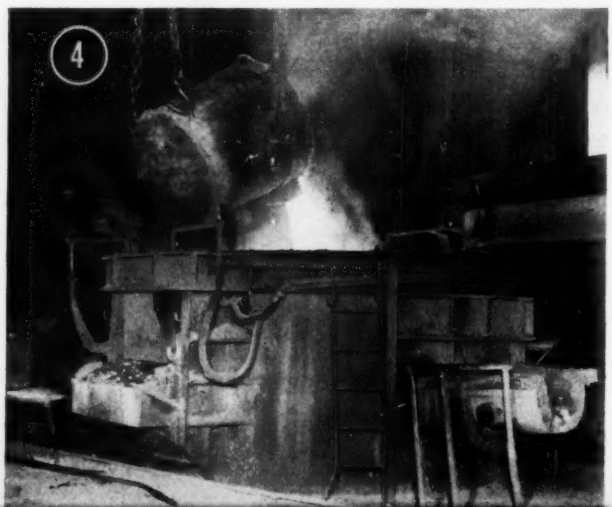


Fig. 4—Re-ladling induction furnace metal into arc furnace

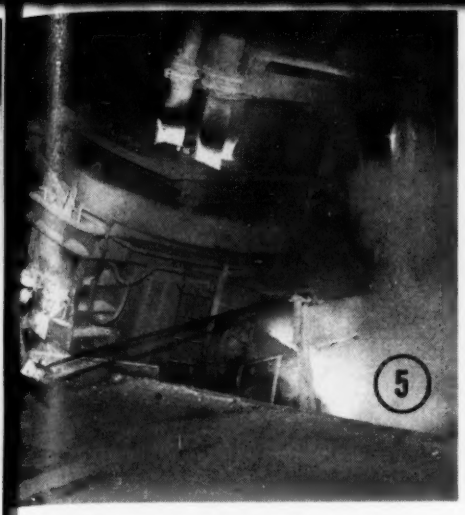


Fig. 5—Tapping heat of duplex steel from large arc furnace

Fig. 6—Typical duplex steel melt sheet used by Babcock & Wilcox Tube Co.

furnace operating time and quality of product.

The company pioneered in the high-frequency induction field as far back as 1924 and designed and built the present furnaces which are powered by a 700 kilovolt-ampere motor-generator set. These furnaces are used in connection with two 15-ton Swindell-Dressler basic arc furnaces of the top charge type. Additional plant equipment consists of a battery of soaking pits; an 8-ton steam hammer and manipulator, which serves as a blooming mill; bloom conditioning facilities; a 24-inch Lewis three-high bar mill with reheating furnace and bar and billet conditioning facilities all designed for the production of seamless tube billets. The arc furnaces are equipped with 6000 kilovolt-ampere transformers and melt heats averaging from 48,000 to 50,000 pounds at rates from 3.2 to 3.6 net tons per hour on high alloy stainless grades.

A typical melt procedure consists of a charge aimed at the production of 40,000 pounds of chrome-nickel stainless. The charge is made up of 17,000 pounds of stainless steel scrap and sufficient nickel, nickel oxide, and other material which after chemistry adjustment will yield the 40,000 pounds. The initial charge is melted, carbon reduced and then the first 5000 pounds of molten stainless scrap is re-ladled from the induction furnace into the arc furnace. After finishing slag is made up, bath chemistry is adjusted by the addition of ferro-chrome, manganese, nickel, etc. Just prior to tap-

(*Please turn to Page* 108)

FORM 240

THE BABCOCK & WILCOX TUBE COMPANY
MELTING RECORD

1

Heat No. 27598 | Grade 18–8S (304) | Procedure No. 34 | Date APRIL 10 1948

ANALYSIS	C.	MN.	S.	P.	SI.	CR.	NI.	MO.
ORDERED	.07 MAX.	2.00 MAX.	.025 MAX.	.025 MAX.	75 MAX.	18.00–20.00	9.00-11.00	
AIM	.07	1.65			50 MAX.	18.60	10.40	
MADE	.06	1.60	.014	.014	23–24	18.56	10.50	

METALLICS			SLAG	CHG.	No. 1	No. 2
KIND	GRADE	WEIGHT	LIMESTONE		REDUCTION	
REVERT— BUTTS AND CROPS	18-8 (304)	17000	IRON ORE		MIX	
B. & W. — BASIC	10–20C Steel	10200	FLUORSPAR		↓	150
B. & W. — ALLOY			LIME		2200	560
B. & W. — TURNINGS			COKE			
NICKEL OXIDE SINTER		1200	SAND			
PURCHASED — BASIC			SILICON FINE 75%		1450	75
PURCHASED — ALLOY			ALUMINUM			
PURCHASED — TURNINGS						
NICKEL		600	ROLL SCALE	4600		
REDUCTION		3600				
Total Charge		32600				

KIND	TIME	WEIGHT	ANALYSIS
FE. SILICON	12 15	200	50% GRADE
FE. SILICON			
CA. SILICON			
ALUMINUM	10 28	19	
SPIEGELEISEN			
FE. MANGANESE	9 38	500	.10 MAX.C GRADE
FE. MANGANESE	11 45	170	.10 MAX.C GRADE
FE. MANGANESE			
FE. CHROME	10 35	6000	.06 MAX. C
FE. CHROME			
FE. CHROME			
MO. OXIDE			
MO. OXIDE			
NICKEL			
NICKEL			
PIG IRON			
CRUSHED ELECTRODES			
HOT METAL (18–8–S) (304)	9 38	5000	
HOT METAL (18–8–S) (304)	12 25	5000	
		49489	

Total Metallics		
MELTER ANDERSON	HEATS ROOF	2
FIRST HELPER MITCHEL	HEATS LINING	32
STEEL POURER THOMPSON	LADLE No.	4
OBSERVER EATON	NOZZLE	1 3/4"
HEAT No. 27598	MOLD COAT	MOLD KOTE

GRAIN SIZE								
METER FINISH	6660000							
METER START	6646700							
K. W. HOURS PER HEAT	13300							
K. W. HOURS PER TON	553							

TAPPED PREVIOUS HEAT	6 08
FINISH BOTTOM REPAIR	6 30
START CHARGE	6 30
POWER ON	6 37
RE-CHARGE	7 55
START DE-SLAG	9 24
FINISH DE-SLAG	9 36
ADD WHITE SLAG	9 40
TAP	12 40
TAP TO TAP	6 32

Preliminary Tests

TIME TAKEN	TIME REPORTED	C.	MN.	CR.	NI.	MO.	Si
8 46	9 12	.08				.06	
9 07	9 35	.06					
10 26	11 37	.06	1.69	10.40	12.15		19
				10.42	12.15		20

ELECTRODES		
Holder 1	Holder 2	Holder 3
Plug	Plug	Plug
Elect.	Elect.	Elect.

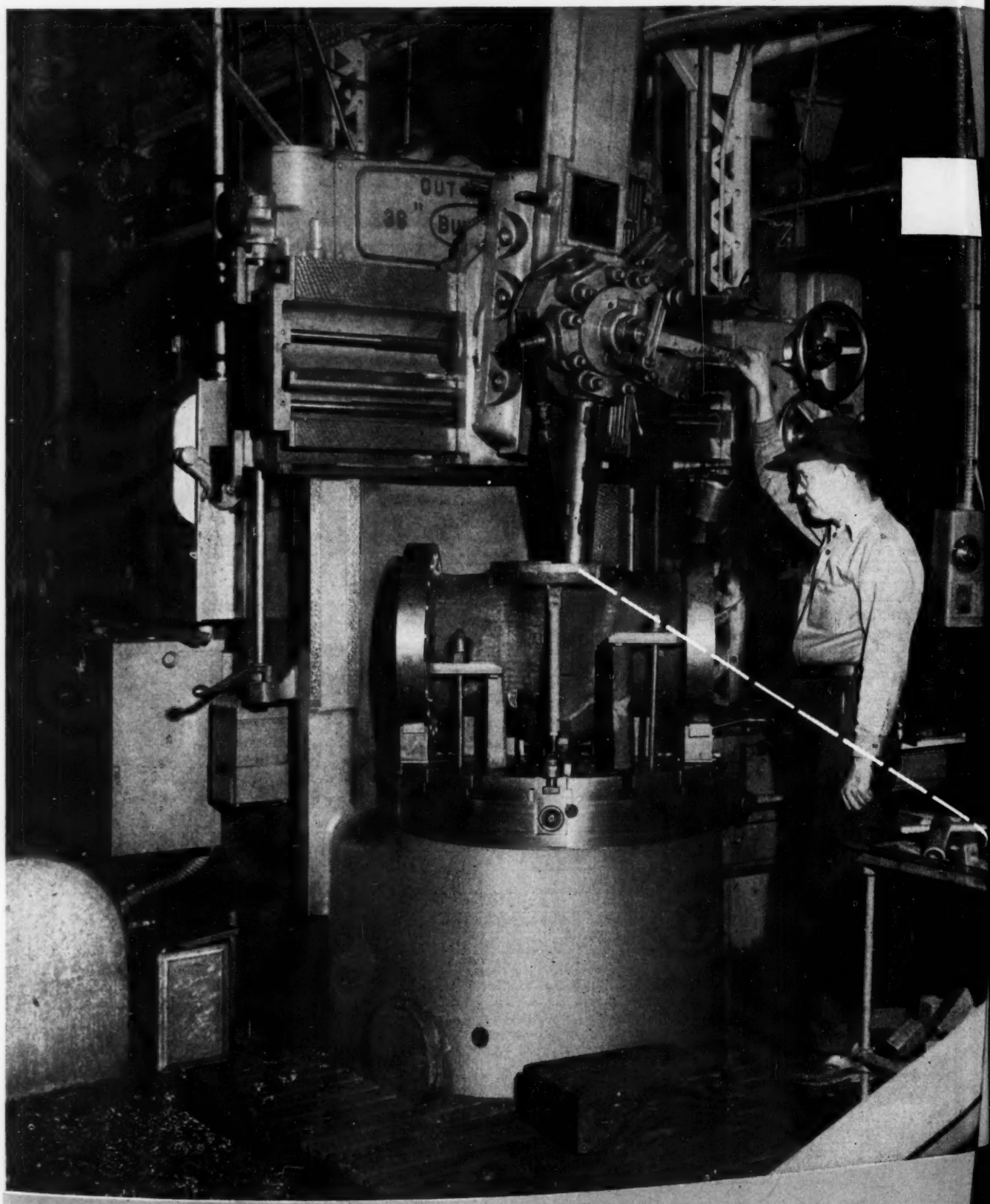
BOTTOM REPAIR	
DOLOMITE	700
RAMIX	200
LIME	
CHROME ORE	

INGOTS		
No.	SIZE	WEIGHT
10	19½X19½	4800
1	BUTT	600
TOTAL	NET	48000

HOT TOPS	
No.	SIZE
10	19½ C & D

TEMP. SLAG OFF	
TEMP. TAP	3050°F
TEEM. TEMP. — FIRST INGOT	2970°F
TEEM. TEMP. — LAST INGOT	2960°F
HELD IN LADLE	8 MIN.
SHUT OFF	OK
STREAM	OK
MOLD CONDITION	CLEAN
PIPE ELIMINATOR	USITE SS
SETTLE	OK
TIME STRIPPED	2 20
SURFACE	GOOD
DISPOSITION	
REMARKS	

6



This BULLARD 36" Cut Master is **"really paying off"** at Newport News Shipbuilding & Drydock Company. Here you see it taper boring a large valve. On this job, it also faces the flange and counter bores, as shown on the cross-sectional drawing. The Cut Master **not only** saved 33⅓% on these three operations **but also** provided such a smooth finish that a grinding operation was eliminated.

BULLARD CREATES

PERFORMANCE REPORT FROM NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY

CUTS COSTS 2 WAYS ON CAST STEEL VALVES with a 36" BULLARD Cut Master

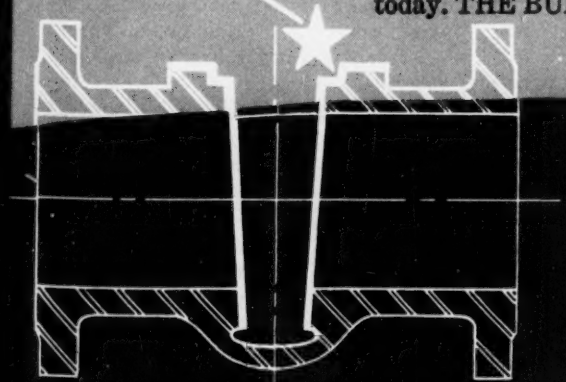
1. SAVED 33⅓% ON 3 OPERATIONS

2. ELIMINATED A GRINDING OPERATION

You, too, can expect savings on most of your jobs. Overall mass weight and rigidity combined with simultaneous cutting of two or three heads, rapid change of speeds and feeds, smooth delivery of power at the point of cutting permit Cut Master V. T. L.'s to take full advantage of the latest in cutting tools. It's easy to see why: The bed is cast in one heavy, rigid piece. Spindle is firmly supported top and bottom by large Timken roller bearings. Screw feeds provide and maintain a high degree of machining accuracy.

OTHER COST-CUTTING ADVANTAGES

Because the BULLARD Cut Master was designed specifically to save time on and between cuts, you find other unique features. The rapid and positive speed selection with the BULLARD pendant type control, limit-stops for simplified dimensional duplication, and centralized operating controls speed up operations and conserve costs. For complete description of these and other distinctive features, as well as data on feeds, speeds and sizes, write for Bulletin CVTL-4-1 today. THE BULLARD COMPANY, Bridgeport 2, Connecticut.



BULLARD

NEW METHODS TO MAKE MACHINES DO MORE

Metallurgical Problems Prominent

In Program for 51st Annual ASTM Meeting

Five-day meeting of the American Society for Testing Materials features symposiums on metallography in color, magnetic testing, deformation of metals, corrosion of ferrous metals, fatigue, and others

WIDE variety of subjects of interest to the metalworking industry occupied a prominent place on the program of the fifty-first annual meeting of the American Society for Testing Materials, held in Detroit June 21-25. Among the 19 symposiums and panel discussions were sessions on metallography in color, magnetic testing, deformation of metals, effect of temperature on properties of metals, corrosion of ferrous metals, corrosion of pressure vessels, creep and fatigue, both ferrous and nonferrous. Also in progress during the 5-day affair was the eighth ASTM exhibit of testing apparatus and related equipment.

Metallography in Color — For the first time, the subject of metallography in color was discussed openly in the society. Like most technical procedures, excellent color reproductions of microstructures can be had if a certain few basic conditions are observed. Some of the technicians who grew up with color set down their procedures for making color pictures of microstructures. Subjects covered precautions necessary to take in specimen preparation, color of illumination of the specimen, and resulting color at the ground glass. The speakers reviewed experiences in photographing nonmetallic inclusions, distinction by polarized light of intermetallic compounds and delineation of grains of alloys.

Magnetic Testing—Rapid development of new and superior magnetic materials in recent years has given rise to new and often difficult problems in connection with magnetic testing. There has been continued activity and development in the field of magnetic analysis by which the condition and quality of materials are determined from the results of the tests.

Solution of various industrial test problems by means of magnetic analysis inspection methods, apparatus and equipment was discussed by Theodore Zuschlag, Magnetic Analysis Corp., in his paper, "Magnetic Analysis Inspection in the Steel Industry". Particular emphasis was laid on the technological and commercial aspects of the instrument method of nondestructive magnetic analysis in production inspection of steel products.

Other papers covered the subjects of testing magnetic materials, permanent magnet testing methods and their validity in determining product performance, core loss test for narrow silicon steel strip, D-C permeability testing of Epstein samples with double-lapped joints, magnetic stress analysis. In the last-named paper, P. E. Cavanagh and T. Wlodek, Ontario Research Foundation, state that in the more exact field of stress analysis by magnetic means numerical values for internal stresses may be obtained by simple mathematical relationships between stress and magnetic properties when specified procedures are followed.

Deformation of Metals—The last few years have witnessed a rapidly accelerating rate of accomplishment in the approaches to a more rational and fundamental concept of metal flow and fracture. These approaches vary from the more academic hypotheses of the physicist and physical metallurgist to those of the works metallurgist. Because of these efforts, it is recognized that such formerly abstract terms as bi-axial and tri-axial stresses, balanced and unbalanced stress patterns, deformation rates and similar factors are really the controlling variables in the fabrication, application and failure of metallic materials.

Findings of students in the field of metal deformation as related to forming and service were summarized in other papers presented at the symposium. These included measurement of ductility in sheet metals, tests of ductility in ship structure, notch-sensitivity in ship-plates; correlation of laboratory scale tests with large scale plate tests, hydraulic bulge testing of sheet metals, notch bar tension tests on annealed carbon steel specimens of various sizes and contours.

Effect of Temperature on Properties of Metals — In their paper, "Studies on Graphitization Susceptibility of Carbon-Molybdenum and Chromium-Molybdenum Steels", J. J. Kanter and A. E. Sticha, Crane Co., conclude that effectiveness of ½ of 1 per cent chromium addition in retarding, although not preventing, graphite formation has been further substantiated. Results of graphitization susceptibility tests on the subject casting steels after 2 years aging at 1025°F generally confirm trends indicated previously.

Sponsored by the joint committee on effect of temperature on the properties of metals, the symposium included these additional papers: High-temperature bolting materials, high-temperature properties of rotor disks for gas turbines as affected by variables in processing; fatigue and static load tests of an austenitic cast iron at elevated temperatures; an experimental study of the influence of various factors on the mode of fracture of metals.

Corrosion of Ferrous Metals—Five-year studies on 71 low-alloy steels in marine and industrial atmospheres show that results obtained depend on the location, duration of tests, manner of exposure, method of estimating corrosion and on weather. In his paper, "Factors of Importance in the Atmospheric Corrosion Testing of Low Alloy Steels", H. R. Copson, International Nickel Co. Inc., stated that under all conditions alloying seems of value, but the magnitude of the benefit, and the relative merit of different steels and alloying elements varies.

The session included other papers on quantitative evaluation of corrosive conditions, laboratory corrosion tests of iron and steel pipes, an investigation of the possibilities of organic coatings for the prevention of corrosion fatigue failures in steel; atmospheric durability of steel containing nickel and copper.

Fatigue—Ferrous Metals — Extent to which certain changes in metallurgical structure affected the fatigue strength and notch-sensitivity of several steels was reported by T. J. Dolan and C. S. Yen, University of Illinois, in their paper "Some Aspects of the Effect of Metallurgical Structure at Fatigue Strength and Notch-Sensitivity of Steel". In general, the authors found, steels rapidly cooled in quenching exhibited higher yield ratios, slightly higher endurance limits and less notch - sensitivity in

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fatigue than the same steels slowly quenched and tempered.

Some characteristics of residual stress fields during dynamic stressing above the endurance limit, effect of fatigue on tension-impact resistance, and an hypothesis for the determination of accumulative damage in fatigue, were among the other subjects reviewed at the session.

Creep and Fatigue—Nonferrous — Principal papers presented before this meeting were concerned with apparatus and factors in salt fog testing, effect of small percentages of silver and copper on the creep characteristics of extruded lead, influence of small percentages of silver on the tensile strength of extruded lead sheathing, tensile, creep and fatigue properties at elevated temperatures of some magnesium-base alloys, fatigue properties of some coppers and copper alloys in strip form.

Industrial Open Houses Described in Booklet

Importance of the plant open house as an industrial and public relations tool is emphasized in a booklet entitled "Open House in Industry," published by National Metal Trades Association, Chicago. It is a 32 page study of current open house practices and analyzes experience of various plants throughout the country.

It is of fundamental importance to industry that it acquire and hold the goodwill of the maximum number of people in the community. Any legitimate public relations technique which can attain this end should be used, the booklet points out, and a spirit of hospitality which expresses itself by inviting people in can usually be counted on to arouse friendly feelings.

Experiences of several companies with regard to community day, family day and special guest tours are described in detail. The community day open house is most inclusive since all elements of the community are invited to participate. Family day events are generally restricted to employees and members of their immediate families. Special guest tours are open houses of varying types arranged for particular visiting groups.

—o—

Instructions for the use of the water flow calorimeter in measuring the heating value of fuel gas, as well as tables required for the necessary calculations and directions for their applications are included in the revised Gas Calorimeter Tables, published by National Bureau of Standards, Washington.

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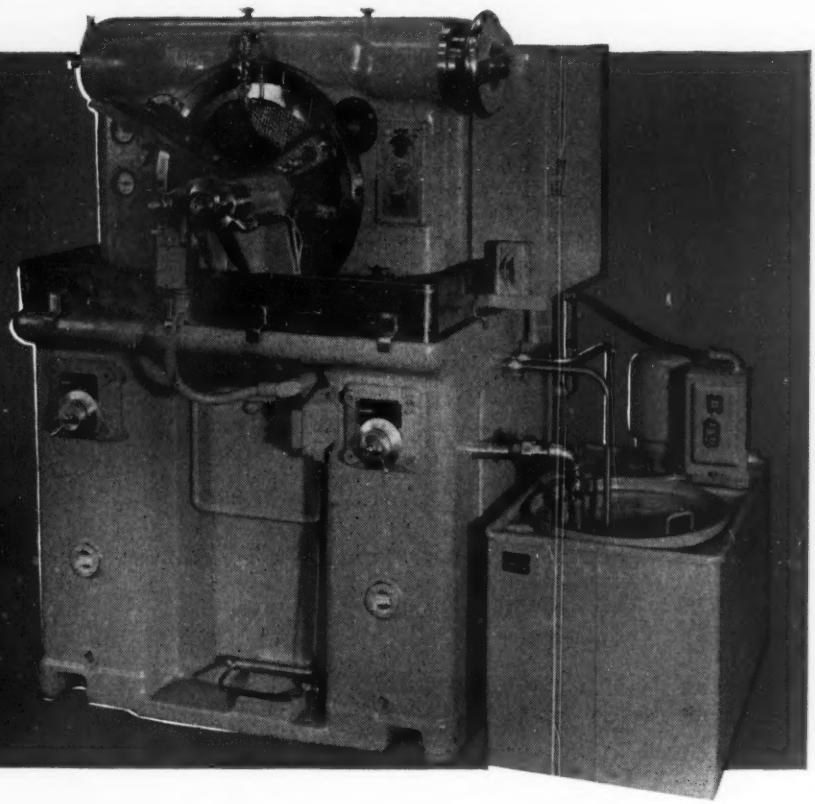

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ability to withstand occasional high temperatures, coupled with electrical properties, has resulted in the use of this type of finish for electrical equipment that operates at high temperature, such as electric irons, toasters and ranges.

Properties listed under (D), hardness and abrasion resistance, added to chemical resistance, have made them useful coatings in withstanding the flow of liquids and gases. For example, centrifugal pump impellers, so coated have been used successfully in a stream of sulphuric acid solution at 150° F. Such coatings have been in use on exhaust fans, blowers and ventilators, in chemical laboratories and plants, withstanding highly corrosive fumes for several years. The phenolaldehyde resins are frequently modified by small amounts of chemical plasticizers or by addition of vinyl resins to give a range of tin coating lacquers. The wide range of properties available, may make them amenable for use as interior can lacquers to withstand forming from the coated sheet, or for use in tin plate bottle caps to undergo drawing and threading.

General Application Methods—Application of a baked phenolic resin finish to a metallic surface involves the following steps:

1. Surface preparation, such as chemical treatment, sandblasting, or acid etching to improve adhesion between the baked resin film and the material being coated.

2. Application of the resin solution to the object by means of spray coating, slush coating, dip coating, roller coating, or brush coating.

3. A 10-minute or more air-drying period immediately after the coating has been applied.

4. A baking cycle to further polymerize the resin and to produce an infusible and insoluble glasslike film.

Resin Baking Castings by Induction Heating—Curing of resin coatings on metal by an electrical method—induction heating—offers many interesting possiblities, eliminating some of the limitations of conventional methods of baking coatings. This method has been applied to the continuous coating and curing of thermosetting phenolic resins on pipe and it offers considerable promise. The process consists of continuously passing the pipe through a tank of the coating solution and then through an electromagnetic field, actuated by low-frequency alternating current. The pipe is almost instantly brought to the desired temperature, and the coating is cured within several minutes, depending on the heat resistance and reactivity of the coating and the power applied. In producing corrosion-resistant iron and steel piping, it is reported that the use of induction heating, applied for 2-6 minutes to phenolic resin coatings, is equivalent to oven baking for 45 minutes at 375° F (191° C) and offers a speedy continuous method of baking.

Phenolic Resin Coatings on Steel Pipe—Value of phenolic resin baking coatings for corrosion resistance in steel pipes has long been recognized. However, a production handicap which had to be overcome was the time and oven equipment for baking. The temperature of about 375° F must be reached, and then maintained for 30 to 45 minutes. However, a continuous induction heating method of curing has been developed[40] which has brought about new interest in this field for protective coatings. The method as developed in the Bakelite Corp. laboratories is as follows:

Sand blasted pipe is introduced into the resin bath and coated inside and out as shown in Fig. 22. It is then mechanically withdrawn, passing through the heating coils, Fig. 25. These coils supply the electromagnetic field actuated by low-frequency alternating current. In this set-up, the pipe is brought from room temperature to 400° F, in 2 minutes by the lower coil, and held at this temperature for 3 minutes by the upper coil, then hoisted out, and allowed to cool. The pipe while being heated is passed through the coil, but is never in direct contact with it. By increasing the amount of power supplied, speed of baking is increased. A diagram of the continuous pipe coating equipment is shown in Fig. 24.

In the use of baking ovens the outside of the coating is heated first, with the possibility of "case-hardening" the film due to the underside next to the metal not receiving sufficient heat. Using induction heating, the film next to the metal is heated first thus assuring proper and uniform curing. The curve shown in Fig. 23 shows a comparison of time required to bake coated pipes in a ventilated oven versus induction heating method using a low frequency alternating current at a power input of only 400 watts. Even with this low power input it will be noticed that the oven required nearly 30 minutes to reach the 350° F temperature, which is obtained electrically in 5 minutes.

Buried Pipe Lines — Extensive studies of the National Bureau of Standards[41] on steel pipes, coated with all sorts of clears, enameled, hot melts and wrapped coatings, and buried in various types of corrosive soils for 4 to 6 years, showed that phenolic resin baking coatings were practically unaffected, even to retaining high gloss after cleaning. The resin coatings are also useful as protective coatings for steel boiler tubes and condenser tubes, and have been suggested as coatings for automobile exhaust pipes and mufflers.

Coating Inside of Steel Tank Cars—For coating large vats or other articles, not amenable to ordinary oven bake or induction heating, either currents of superheated air, or portable infrared lamps may be used. Another serviceable application of the phenolaldehyde resin coatings, utilizing special methods of heating, is in the lining of steel tank cars. In the past most of the tank cars used on railroads have been manufactured from heavy steel plates, riveted together at the seams and transported on standard railway carriages.

Today, welded construction is being featured prominently in tank car construction because these cars are easier to clean, they minimize content seepage, and protective coatings

TABLE IV

ELECTRICAL PROPERTIES OF PHENOLIC RESIN COATINGS

(Values represent corrections to 1 mil thickness, tested at 25° C unless otherwise noted. Tests were made in accordance with ASTM methods)

	Type 1	Type 2
Dielectric Strength, short time, volts per mil	3000 to 4500	2250 to 4000
Power Factor (Films removed from metal panels):		
At 60 cycles	0.009 to 0.018	0.005 to 0.007
At 1000 cycles	0.0094 to 0.0095	0.0038 to 0.0041
At 1,000,000 cycles	0.019	0.017
Dielectric Constant (Films removed from metal panels):		
At 60 cycles	3.5 to 3.8	3.5 to 3.6
At 1000 cycles	3.6 to 3.7	3.5 to 3.6
At 1,000,000 cycles	3.4	3.35
Loss Factor (Films removed from metal panels):		
At 60 cycles	0.031 to 0.069	0.019 to 0.025
At 1000 cycles	0.034 to 0.035	0.013 to 0.015
At 1,000,000 cycles	0.065	0.060
Volume Resistivity (1 mil films on metal panels):		
Megohm cms at 30 deg. C.	approx. 3.0×10^8	approx 1.0×10^9

may be more easily applied to their smooth uninterrupted surfaces. This last factor is an important design consideration, since in many cases, coatings are a definite part of the structure and should be planned as such to achieve the maximum in efficiency.

A special type of phenol-formaldehyde resin, a balanced mixture of solvents, which is known by the trade name of "Lithcote" finishes, has been developed by the Bakelite Corp. and has found wide use in coating tank car interiors. In processing these coating materials, certain plasticizing resins are introduced, with an addition of quartz, and ground into the coating in porcelain lined ball mills.

It is reported[42] that the addition of the quartz increases the resistance of the coating to heat and acids (except hydrofluoric) and increases adhesion. In routine operations the coating is applied only to sand blasted surfaces; this is carried out on tank interiors as shown in Fig. 26. After sandblasting, the car is carefully inspected before the first coat is applied. Each coat is again inspected, and the tank is heated to temperatures high enough to harden the film. Multiple coats are then applied.

High efficiency furnaces are adjusted, and outlets are directed for proper flow of hot air, to prevent certain portions of the surface from being overbaked, and others from being underbaked. The bake is reported to require about 10 hours. Thermocouples at various points indicate temperatures as the bake progresses. The end temperature is approximately 340° F and the steel temperature is held at that point for ½-hour. Cooling takes place over night, following which the steel car is given a final inspection.

(To be continued)

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New Approach on Science Of Metals Provided

Subject matter of a new textbook entitled, "Metallurgical Materials and Processes," written by John Elberfeld and published by Prentice-Hall Inc., New York, is intended to provide persons working in industry with a general background for the science of metals. Some of the topics covered include: Refining of metals, mechanical properties of metals, fabrication, grain structure, heat treatment of steel, ferrous and nonferrous metals and alloys, welding metallurgy and powder metallurgy.

An outline of the necessary chemistry for an understanding of text material is included in appendix. A bibliography, divided by topics for greater ease in finding desired material, is added for those who wish to investigate a particular subject more deeply.

Fifteen-Second Shave

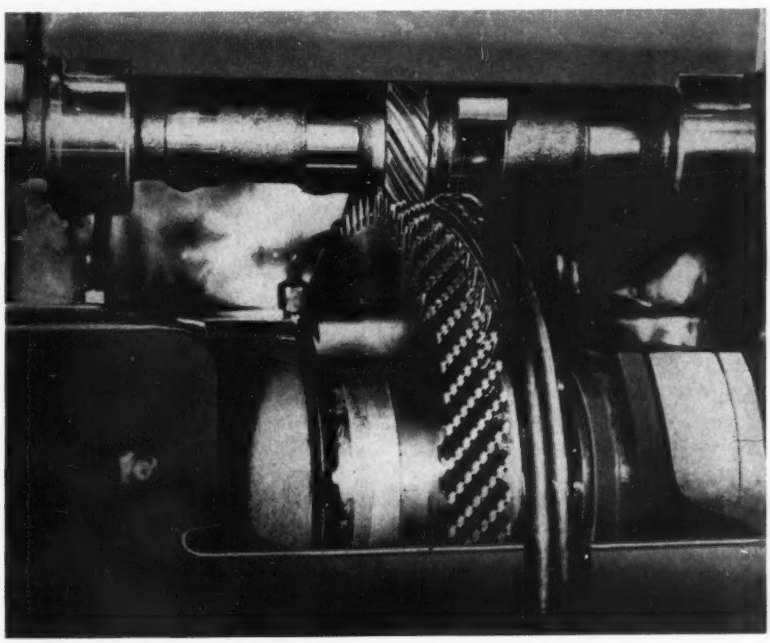
. . . produces distributor shaft drive gears

EACH of the semiautomatic underpass shaving machines used in making distributor shaft drive gears which are integral with the Ford 6 camshaft turns out one finished gear every 15 or slightly less seconds at River Rouge, Mich., plant of Ford Motor Co. One operator can easily run three machines with each having a floor-to-floor time of 0.737 minutes resulting in a total output of 1953 camshaft gears every 8 hours.

Basically, machines are standard model 860-A underpass machines made by Michigan Tool Co., Detroit, and equipped with steady rest and an extra long head slide to handle 27½-inch shaft. As shown in the accompanying illustration, the steady rests support the camshaft at bearings closest to gears and are in the form of babbitt lined shoes above camshaft. Since cutting pressure is directly upwards on camshaft, steady rest prevents deflection and insures that runout tolerance on gear is maintained.

Since gear comes to shaver in rough hobbed form, 0.004-inch of stock must be removed at ends of teeth and 0.002-inch near center. After shaving, tolerances on chordal thickness have to be within plus or minus 0.0005-inch, while runout has to be within plus 0.000-inch and minus 0.001-inch.

Rotary cutter is merely fed forward and back once, tangentially to work, while work and cutter rotate in mesh. Machine then stops for reloading. In loading position there is some backlash between cutter and gear.



Progressive Dies—*Concluded from Page 80*

What type of pressure (air, spring or rubber) is to be used?—Pressure on draw pads may be springs, rubber or air depending on the length of the draw. Air pressure is the most constant and is more dependable. Rubber pressure builds up on long draws and pressure increased adds to tonnage required to operate the press. Springs are satisfactory when compressed to one third of their over-all free strength, but when compressed beyond that point they weaken or become crystallized and breakage results through continuous use.

Is the machine in which it is to be used capable of feeding stock to sufficiently accurate pitch to allow pilots to align work properly?—There are many types of feeding mechanisms and automatic presses on the market; it has been found that there is a variation in feed pitch in many of these. This is a problem that has confronted many die makers. To remedy this defect to some extent pilots have been added whenever and wherever possible. This corrects any slight change in feed pitch. Studies are being carried on at the present time to determine changes at various speeds, using different materials of varied widths and thicknesses.

Are gages and lifters or ejectors so arranged in die that their functions will not interfere with stock passing through the die on successive operations?—In most dies it is necessary to have gages to keep stock in line and to start stock at the proper place. Lifters in conjunction with ejectors are used to keep strip at a level above die so that in moving from station to station parts will not tip or become retarded by obstruction and thus prevent proper feeding to next pitch. Stock at all times should be free to be pushed through entire die to avoid fouling.

What disposition can be made of scrap and finished products to eliminate too much handling?—In high speed production it is necessary to dispose of scrap as soon as possible with the least amount of handling. Best practice is to allow scrap to remain in strips and then cut up in small pieces at the end of the die or press equipped with scrap cutter. This can then be guided to a receptacle suitable for easy removal when full. Slugs and small punchings which go through the die can be deflected to another easily-removed or emptied receptacle.

Can individual chutes be installed to facilitate the handling of finished products? — A great deal depends upon the shape of the product — whether it can be stacked or be taken from the die by way of chute. These can be so designed that they will fasten to the bolster plate and will not be disturbed when removing the die from the press for sharpening or repairs. A spring presure pad will keep parts from getting crossed or jamming chute. Pressure should be adjusted so that parts may move through chute with just enough freedom so they will not slide too easily and yet not be tight enough to jam or back up into the die.

Can die be built to accomplish necessary production at reasonable cost?—One of the biggest problems today is to make the die at a reasonable cost. Economy is not so much in the material to be used but how the die is designed, how accurately it is built and how much time will be saved with successful operation. It is possible to incorporate many intricate operations such as cam, extrusion or piercing or very small holes which cannot be given sufficient strength. In an over-all account the initial cost while high would be increased through repairs and upkeep.

Best possible results will be obtained by getting the maximum operations with the least amount of weak and complicated stations. Careful study of the part to be made is essential and from there development and tryout will help to build a progressive die with a minimum of headaches later on.

NICKEL STEEL RESISTS DAMAGE ... in low temperature drop test

VESSELS of 8½ per cent nickel and stainless steel showed no material damage while a carbon steel vessel was shattered upon first impact of a weight dropped from a height of 5 feet while the vessels were filled with liquid nitrogen in tests sponsored by International Nickel Co. Inc., New York, and conducted at Air Reduction Apparatus Research Laboratory, Murray Hill, N. J., before some 100 engineers of leading industrial concerns. All major joints were x-rayed for defects and vessels were subjected to a 700-pound hydrostatic test prior to drop test.

For the nickel steel and stainless steel vessels, a weight of 292.9 pounds was dropped from a height of 5 feet at intersections of longitudinal and transverse seams, at two locations along longitudinal seam and on flange of nozzle. A weight of 184.9 pounds was dropped from the same height on the carbon steel vessel near longitudinal seam about midway between one end and nozzle. Test was conducted at a temperature of below minus 300° F.

Although 8½ per cent nickel steel, AISI 2800, was commercially developed primarily for engineering structures at low temperatures, it is being found to possess a versatility which fits it for a variety of applications at low temperatures. In addition to probable use for sucker rods in corrosive oil wells, tubing in deep oil wells, and seamless tubing in black liquor evaporators in pulp and paper industry, excellent service has been obtained in a trial installation of solder rolls used in making tin cans.

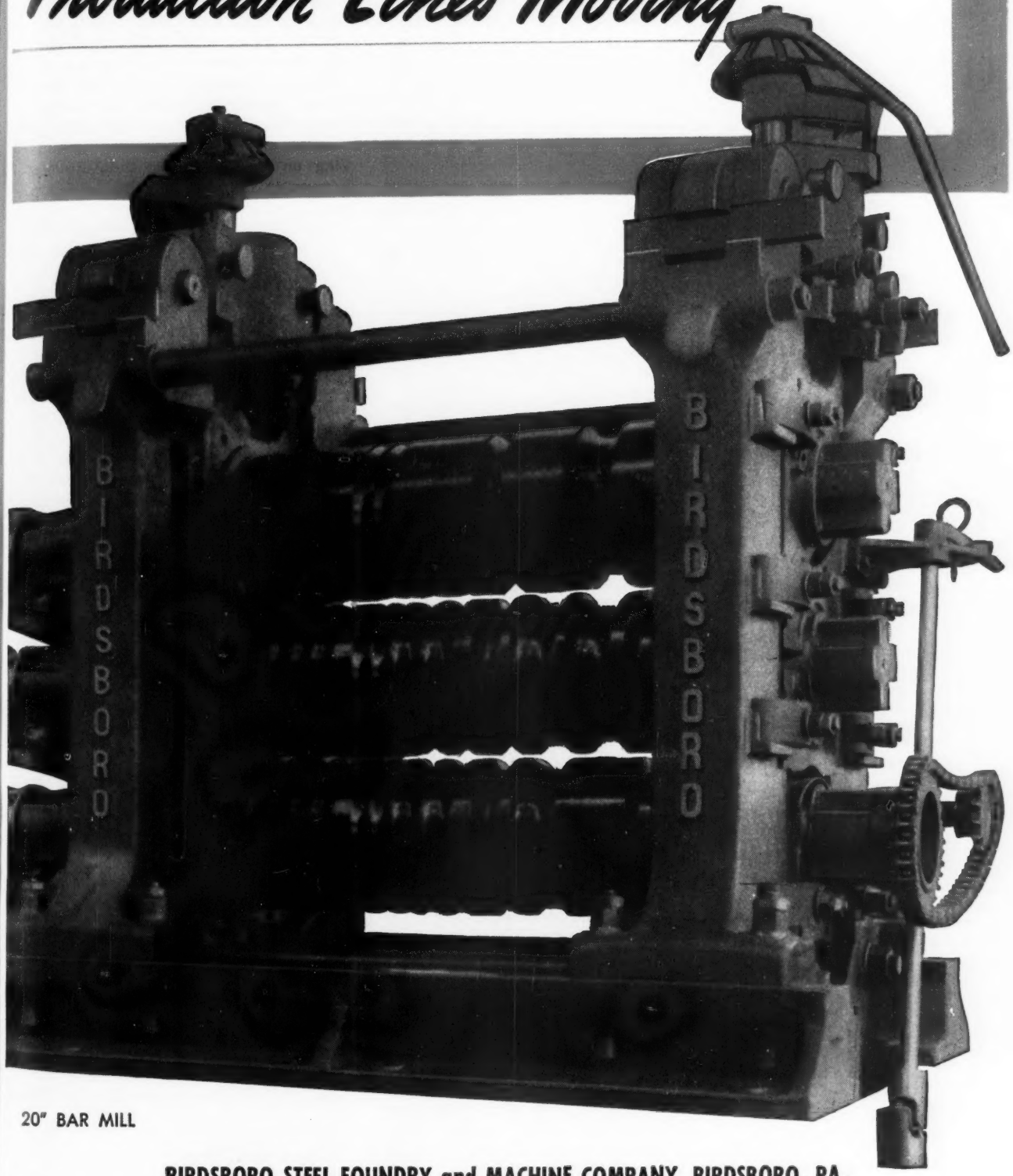
Nickel steel alloy cannot be considered a replacement for 18-8 chromium-nickel stainless steels and is not suggested as a replacement for low alloy steels where high strength is the primary consideration. In certain respects the new nickel steel does have such advantages as combinations of valuable properties with moderate cost. These factors will ultimately determine its proper position as an engineering material.

Shovel Manufacturer Conducts Service School

Factory training for 165 service engineers was provided at the distributors' service school conducted by Thew Shovel Co., at its Lorain, O., plant. Purpose of the recently completed course is to provide the best possible service for users of the company's products and to make factory trained service personnel available to them.

Service engineers attending the school receive illustrated lectures, study slide films showing exploded views of all parts and discussed problems which have arisen in actual field operation. In addition they perform service operations on component units of equipment.

Production Lines Moving



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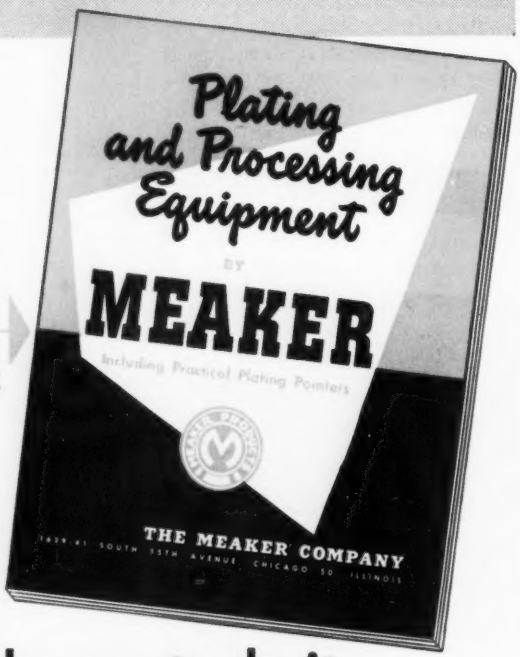

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Duplexing Steel Operation

(*Concluded from Page* 93)

ping, the second 5000 pounds of molten stainless scrap is added to the arc furnace bath, approximating a total bath weight of 50,000 pounds. The furnace is tapped in the conventional manner and the ladle is teemed into nine or ten 19½-inch square ingots with C&D hot tops—the molds in the plant are manufactured by either Vulcan or Shenango-Penn. Ingots are stripped, charged into the soaking pit and hammer cogged into blooms suitable for rolling on the Lewis bar mill. Rounds from 2¼ to 8 inches in diameter are produced on this unit and all stainless steel bars are turned to eliminate any trace of surface defects. After being cut to finished billet weights they are delivered to the tube mill for piercing, rolling and drawing into finished seamless tubing.

The company has four piercing mills in their tube plant which is located approximately a mile from the steel plant. However, only two of these mills are used for stainless production. All mills are of the 60 degree cone-roll type and they cover a range of tube sizes from 2 to 8⅝-inches in diameter. These mills were designed by the company and built by Aetna-Standard Engineering Co. In addition, the tube plant has two cold finishing units producing cold drawn tubing in sizes up to 8 inches in diameter.

Ventilation System Safety Codes Studied

Recognition of the fact that engineering principles can be used to advantage in exhaust system ventilation to remove toxic fumes and gases, has led to the reorganization of the sectional committee on safety code for industrial exhaust and ventilation. Committee is organized under procedure of American Standards Association, New York, and is sponsored by International Association of Industrial Accident Boards and Commissions.

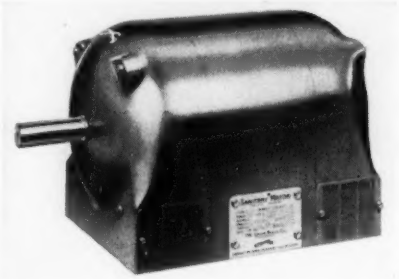
Work of the committee is being planned around specific operations for which exhaust ventilation is needed rather than for the development of specifications by industries or for the equipment. Operations agreed upon as the basis for future work include: Mechanical cutting, surface coating, open tank operations, solid materials handling, fuel burning exhaust gas producing operations, molten materials handling, welding, burning and soldering, volatile and gaseous material handling.

New Products and Equipment

Sanitary Motor

Sanitary motor has been developed by Louis Allis Co., Milwaukee 7, Wis., and can be operated in wet, humid location or washed down with pressure hose without injury to windings. Single end ventilation by means of two fans in series insures adequate cooling for windings, stator laminations and rotor. Temperature rating is 50° C rise.

Motor is available in all standard or special voltages, frequencies and

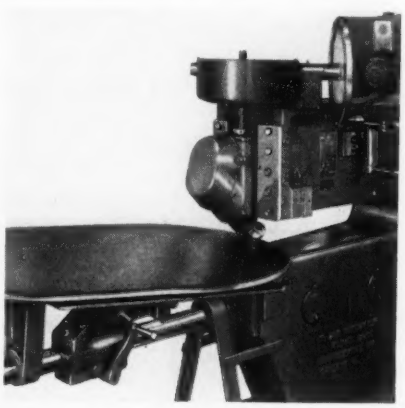


speeds. It is also available with special torque characteristics and single or multiple winding multi-speed construction. Base is milled flat, permitting mounting of motor on flat surface. Mounting bolt holes are located per NEMA standard dimensions with access through removal grilles or plates.

Check No. 1 on Reply Card for more Details

Automatic Shear

Sheets and plates may be sheared, flanged and formed in many odd and irregular shapes by the automatic shear, flanger and former, made by Kling Bros. Engineering Works, 1300 North Kostner Ave., Chicago



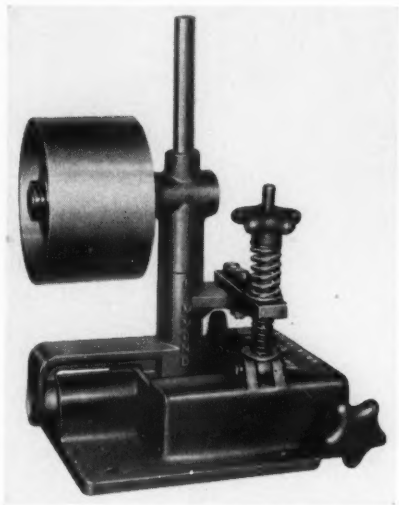
51, Ill., for its rotary or circle shears. Once the sheet or plate has been placed in position, the operation is guided automatically. Locating holes in the heads can be eliminated by spot welding small collars to the bottom side and removing them when operation is completed. Holes can be used and then plugged.

Attachment is designed for use with the rotary or circle shears, but it can be adapted to any machine employing circular cutting, flanging or forming rolls. The only handling necessary is the placement of the part to be processed in position and the final removal of the finished product.

Check No. 2 on Reply Card for more Details

Bench Backstand

Abrasive belts up to 4 inches wide may be used with the model 6-B bench backstand with 8 x 4½-inch pulley, made by Hammond Machinery Builders Inc., Kalamazoo 54F,



Mich. Offered in both left and right hand models, it has a dynamically balanced aluminum pulley mounted on sealed lifetime lubricated ball bearings. Its heavy cast iron base is drilled for mounting.

Backstand is equipped with a convenient tension release lever for quick and easy changing of belts. The spring-loaded belt tension adjustment is operated by a sure-grip hand screw. It also has a positive hand screw operated belt tracking adjustment. Mounting may be in any position.

Check No. 3 on Reply Card for more Details

Dynamotor

Gothard Mfg. Co., 2110 Clear Lake Ave., Springfield, Ill., is producing the model GP-26 dynamotor which is available in a range of capacities to meet various requirements. Power output ranges up to 80 watts continuous and 150 watts intermittent duty. Voltage regulation averages 19 per cent, with efficiency about 61 per cent.

It is particularly adapted to installations where weight and size are important considerations. Features include high tensile strength armature shafts, double impregnated windings,

precision wound coils, steel housing and cast iron brackets. Dynamotor has self-lubricating ball bearings. Ratings are conservative, affording ample overload margins.

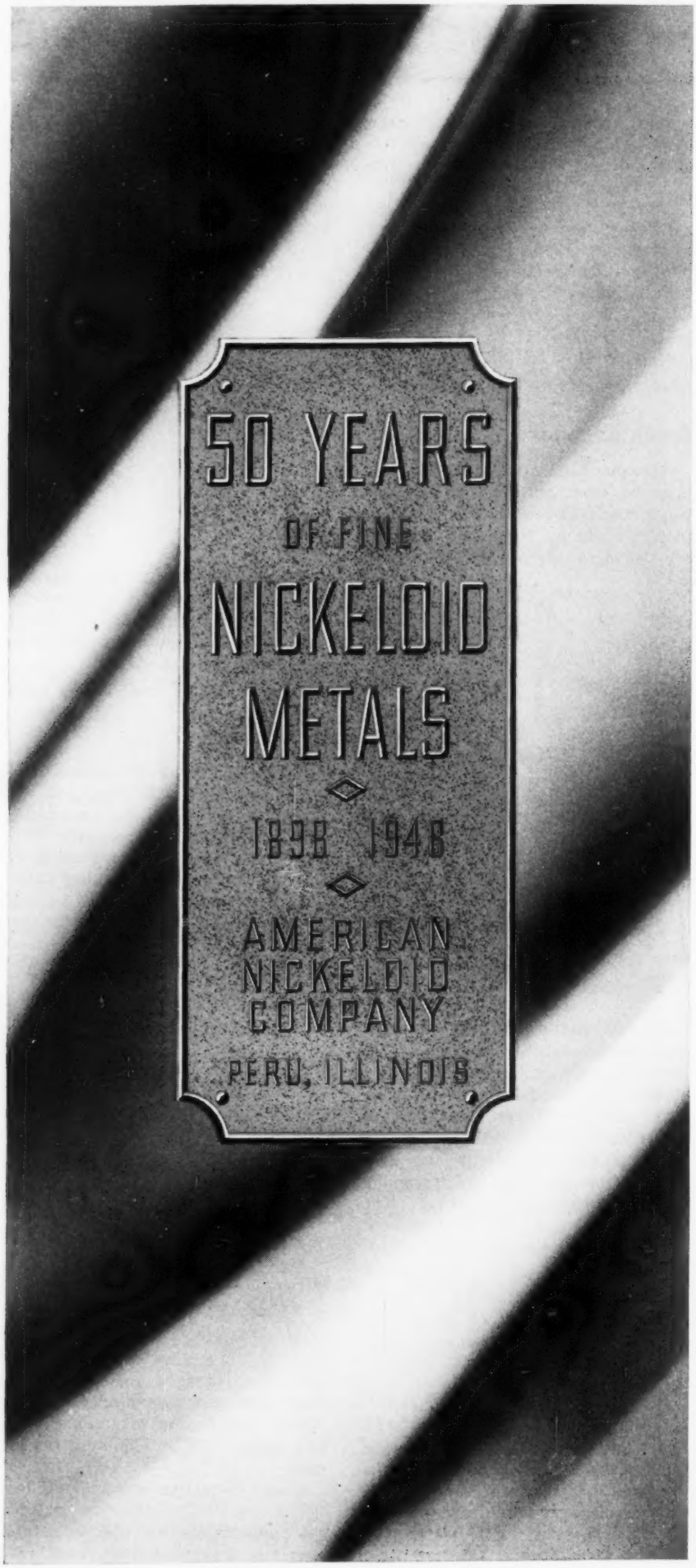
Check No. 4 on Reply Card for more Details

Fork Truck

Industrial Truck Division, Clark Equipment Co., 258 Champion St., Battle Creek, Mich., is announcing the Yardlift 60, a pneumatic tired fork truck of 6000 pound capacity, designed for outdoor handling operations and smooth movement of unit loads over any rough uneven or slip-

pery surfaces. Features of the new truck are: Frame of heavy rolled steel, cross braced and welded into an integral unit; a 6-cylinder 50-horsepower engine; pivoted steering axle; and heavy duty full floating driving axle.

Double reduction steering mechanism makes the trucks easy to steer. The pneumatic-cushioned adjustable seat has an upholstered back rest.

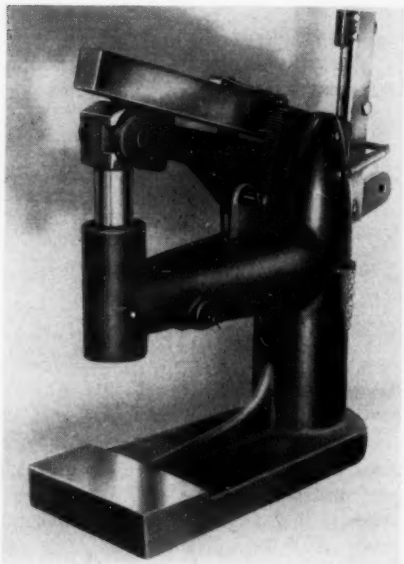


All parts are readily accessible for servicing. Standard lift is 112 inches with an overall height of 85 inches.

Check No. 5 on Reply Card for more Details

Staking Machine

Designed for staking or riveting fixed or movable joints, the line of automatic staking machines, developed by High Speed Hammer Co. Inc., 313 Norton St., Rochester 5, N. Y., is equally adapted for such operations as eyeletting, inserting



grommets, burring and pointing with platinum, tungsten or silver. Hammer blow may be adjusted for proper amount of pound blow, each blow being uniform

Four different models or sizes are offered, each available in either manual or motor driven types. Work is held firmly by a pressure pad while blow is being struck by hammer. Production may be in excess of 1000 pieces per hour. It is impossible to trip hammer with fingers in die or with locking pin in place when machine is not in operation. Operation may be by inexperienced operator.

Check No. 6 on Reply Card for more Details

Shape Cutting Machine

Model SC-42 shape cutting machine, developed by Ohmstede Machine Works, 897 North Main St., Beaumont, Tex., can be quickly set up for cutting a few parts by using a templet of plywood. For production cutting a steel templet can be made by cutting it from a plywood templet. Tracing from steel templets is magnetic, making possible cutting of an unlimited variety of shapes.

Use of high strength aluminum alloys makes the machine stable and rigid under all conditions. Oversize

4-WINGED DRIVER CAN'T SLIP OUT OF PHILLIPS TAPERED RECESS

"Hearing is Believing"

THAT

AMERICAN PHILLIPS SCREWS

Cut Costs···Kite Sales

...when you listen to makers of Electronic Products like these:

HOW THEY CUT COSTS: Says one hearing-aid manufacturer, "American Phillips Screws save us as much as 50% in time alone — and what they've saved us by banishing spoilage runs into even *more* money!" Simply because American Phillips Screws can't slip, can't slash, *can't drive any way but straight*. And because they're so much easier to handle, aim, and drive . . . without "dropsy."

HOW THEY KITE SALES: American Phillips Screws give all types of products a smart new look . . . a strikingly improved appearance over ugly, burred, slotted screws. And when you really *merchandise* their better holding power and greater vibration-resistance —which add up to fewer servicing needs — you've got an earful that drives home more sales. Find out what American Phillips Screws can do for *your* product. Write.

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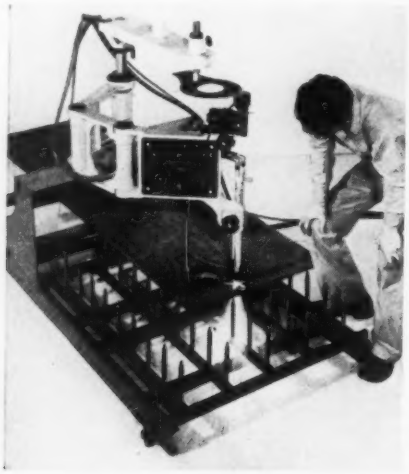
AMERICAN PHILLIPS *Screws*

ALL TYPES

ALL METALS: Steel, Brass, Bronze, Stainless Steel, Aluminum, Monel, Everdur (silicon bronze)

antifriction bearings are used in the arms, sealed from foreign matter. Its variable speed motor is of the totally enclosed type. All electrical



and flame cutting controls are located on a panel within easy reach of the operator. Speed may be varied from 3 to 30 inches per minute and by using different sizes of tracing rollers this range can be increased or decreased. Handwheel controls height of cutting torch. Machine, which operates on either alternating or direct current will cut a 42-inch diameter circle or a 89-inch straight line.

Check No. 7 on Reply Card for more Details

Brushing Equipment

Made of stainless steel to withstand the corrosive effect of the pickling or cleaning solution and rusting due to water spray, the brush box, built by W. S. Rockwell Co., 200 Eliot St., Fairfield, Conn., is for continuous cleaning of steel or nonferrous strip after it has passed through a pickling or cleaning solution. The strip, either in a single broad width or a series of narrow strips, up to a total width of 60 inches, enters the brush box and passes over a set of spring tension wringer rollers which press out most of the acid and water before it passes through the brushes.

From wringer rollers strip passes between anvil rolls and the revolving tampico fiber or stainless steel brushes. Rollers are driven in same direction and at the same speed as the strip. Four independently powered brushes operate in opposite direction of strip. They are oscillated approximately 3 inches by cams. Tension between brush and strip can be regulated as shown by a visible gage. Another set of wringer rolls remove water before the strip leaves the box.

Check No. 8 on Reply Card for more Details

Core Baking Oven

Despatch Oven Co., 619 South East 8th St., Minneapolis, Minn., is producing an oven for production core

baking in small foundries and for auxiliary equipment in large opera-

A Complete Warehouse Service for...
SHEETS • PLATES
STRIP • STAINLESS STEEL
TIN PLATE • BARS • SHAPES
WIRE PRODUCTS • ALLOYS
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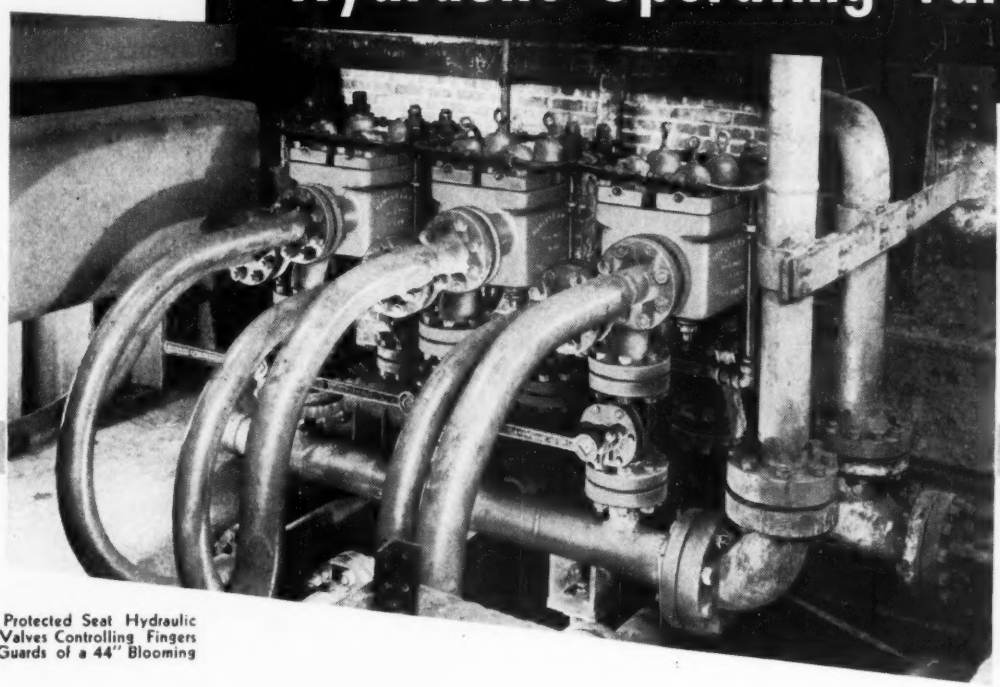
FAST...SMOOTH...ACCURATE...DEPENDABLE

and 75% less expensive to maintain

HOMESTEAD PROTECTED-SEAT Hydraulic Operating Valves



4" 4-way Protected Seat Hydraulic Operating Valves Controlling Fingers and Side Guards of a 44" Blooming Mill.

THESE valves are used the world over in mills and metal working plants for the control of presses, stampers, furnace doors, manipulators, soaking pit covers, shears, ingot strippers and other hydraulic equipment. Their fast, smooth, accurate, dependable operation is assured by an exclusive, built-in feature, the Homestead "protected-seat."

The "protected-seat" consists of a closely fitted sleeve and an inside plunger which reduce fluid flow to a low velocity trickle while the seat and disc are still widely separated, thus eliminating "wire drawing" or cutting of the seat and resulting leakage and piston "slip."

Maintenance costs are extremely low. Records of twelve to eighteen months continuous service without so much as the replacement of a fiber disc are common.

We will be glad to send you complete details and a copy of Valve Reference Book No. 38 without obligation. Why not write today?

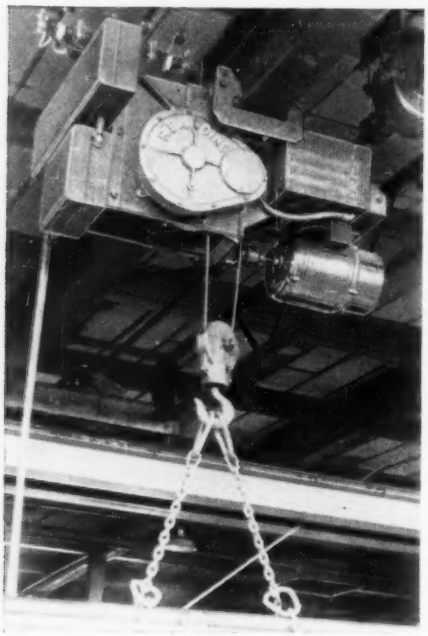
Homestead Protected-Seat Hydraulic Operating Valves are made in 3-way or 4-way types, or in single poppet types to control hydraulic spray for descaling; sizes ½" to 4", hand or remote control, for pressures up to 3000 pounds.

HOMESTEAD VALVE MFG. CO.

P. O. BOX 22 CORAOPOLIS, PENNSYLVANIA

for *more* output

UNTIE YOUR WORKERS' HANDS!



Six men were moving these steel bars from flat cars to stockpile, and thence to cutting saws and shipping carriers. To speed handling, a *Reading* Engineer was called in. A *Reading Electric Hoist,* right angle mounted, plain trolley, on a single I-Beam motor driven crane was recommended and installed. Now the job is handled by only three men . . . bars move faster . . . *and the three "extra" men have been switched to other productive jobs!*

For an analysis of your handling operations, at no obligation, contact *Reading,* today. Write for "The Why and How of Faster Production".

READING CHAIN & BLOCK CORPORATION
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CHAIN HOISTS • ELECTRIC HOISTS
OVERHEAD TRAVELING CRANES

READING HOISTS

tions. It will accommodate large cores as well as small ones, rush jobs, drying and pasting. The forced convection, gas fired, forced exhaust oven has automatic safety and temperature controls which can be set for any temperature up to 450° F.

From two to six shelves may be placed in the two openings of the Junior model. Each opening is 24 x 36 x 30 inches. The oven itself occupies 16 square feet of floor area. The Senior model consists of two complete Junior models, engineered into one cabinet with partition. Attachment to gas line and plugging into 110-volt current sets the oven up for operation.

Check No. 9 on Reply Card for more Details

Chuck Generator Sets

Motor Generator Corp., Troy, O., is announcing a line of motor generator sets designed to operate the magnetic chucks of vertical spindle and rotary surface grinders. Sets are offered in generator capacities

ranging from 500 to 25,000 watts direct current.

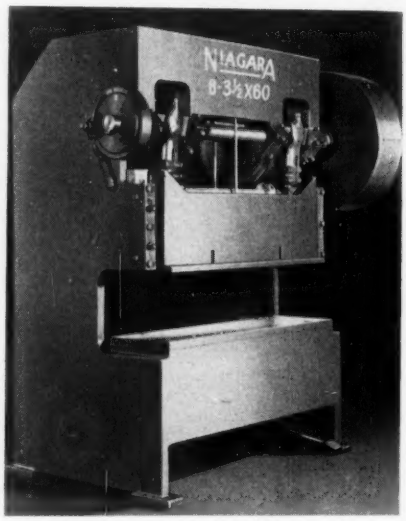
Size of generator required depends upon the size of the magnetic chuck and whether it is of the circular or of the rectangular flat type and if multiple chucks are to be operated from one generator.

Check No. 10 on Reply Card for more Details

Gap Frame Press

Convenience of a "C" frame and the width and stability of the double crank press are combined in the gap frame double crank power presses of welded steel, introduced by Niagara Machine & Tool Works, 637 Northland Ave., Buffalo 11, N. Y. The short strokes, rigid box crown and deep bed make it suitable for use with fine blanking dies and for forming work requiring heavy load at the bottom of stroke.

Long or irregular sheets and strips can be fed either front to back or right to left. Pinion is supported between antifriction bearings, holding the back shaft in alignment with the main gear. Other features include a 14-point engagement sleeve

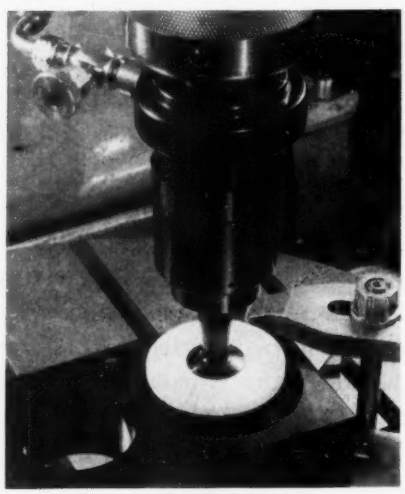


clutch, antifriction bearings in the clutch wheel, air counterbalance for slide and a compensating and indicating brake. Presses are built in seven sizes ranging in capacity from 44 to 244 tons. Machines in each size are made in five or six widths.

Check No. 11 on Reply Card for more Details

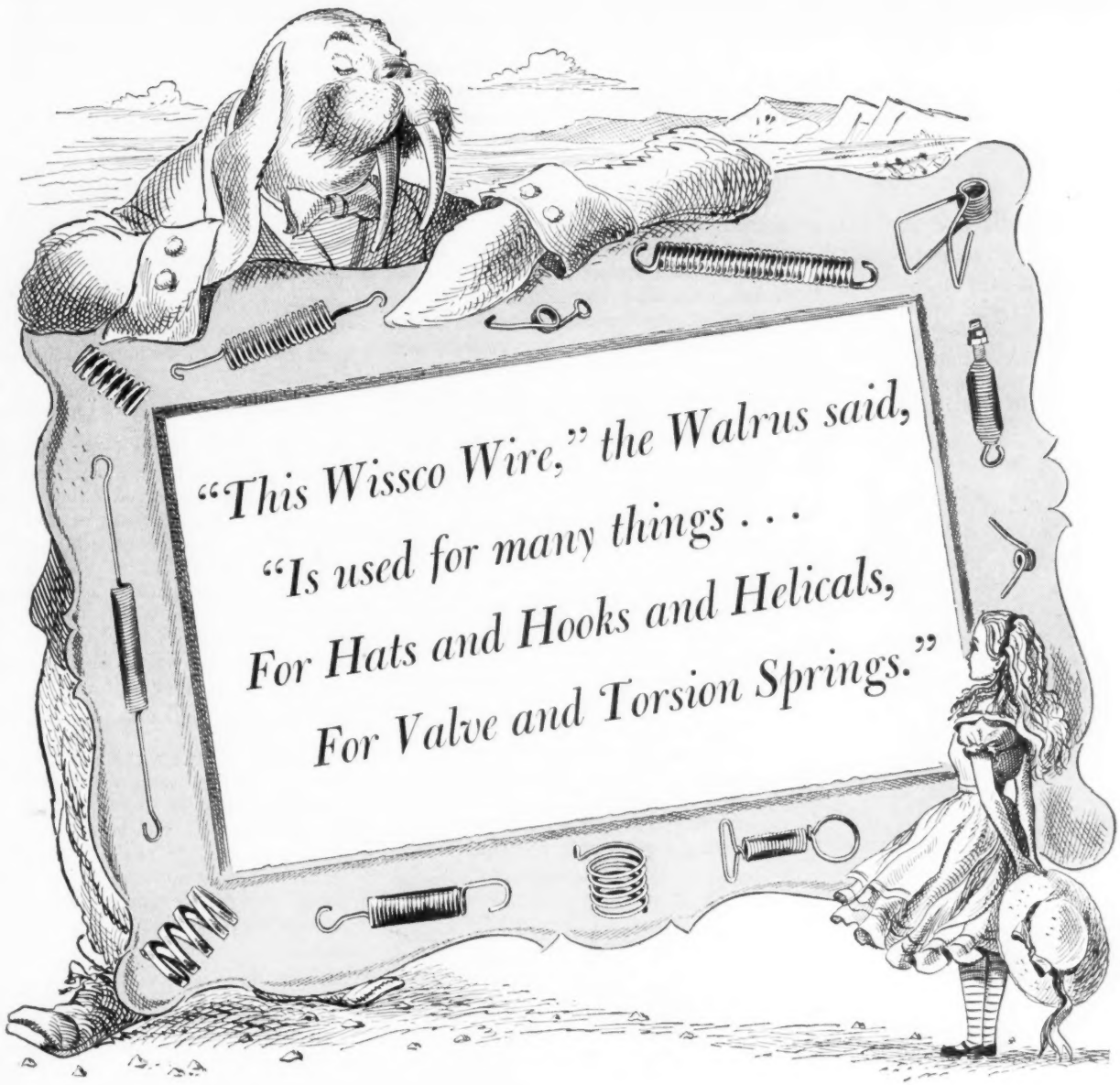
Jig Grinder

An air driven attachment which can quickly and economically convert jig borers and other machine



tools into precision jig grinders is the series 20,000 Vulcanaire, manufactured by Vulcan Tool Co., 730 Lorain Ave., Dayton 10, O. It is designed for accurate jig grinding in the 1½ to 4 inch diameter range.

Attachment is equipped with a special adapter to fit into the chuck of any machine tool on which such



BECAUSE of its fine quality, Wissco Oil Tempered Wire is becoming the first choice of more and more manufacturers whose products require this type of wire.

Wissco Oil Tempered Wire is characterized by its uniformly high tensile strength, torsional value and fatigue life. It is supplied in a size range of from .010 to 9/16" in coils, diameters ranging from 8" to 6' and in cut lengths.

For this and scores of other steel specialty wires, call Wickwire Spencer. We can meet your needs for high or low carbon steel wire; round or shaped; in a wide variety of sizes, tempers, grades and finishes. And, if you have a wire problem, our metallurgists will be happy to help develop the type of wire that best meets your requirements. Send your wire questions to Wickwire Spencer.

WISSCO *Wire*

A PRODUCT OF WICKWIRE SPENCER STEEL DIVISION · THE COLORADO FUEL AND IRON CORPORATION

WIRE SALES OFFICE—361 DELAWARE AVE., BUFFALO 2, N. Y.

EXECUTIVE OFFICE—500 FIFTH AVE., NEW YORK 18, N.Y. · SALES OFFICES—BOSTON·CHICAGO·DENVER·NEW YORK

PACIFIC COAST SUBSIDIARY—THE CALIFORNIA WIRE CLOTH CORP., OAKLAND 6, CAL.

CF&I

operations are required. Standard accessories, consisting of a portable stand on which is mounted an air cleaner, regulator, gage and oiler and dust collecting system, are used.

Check No. 12 on Reply Card for more Details

Flat Bead Drill Grinder

Developed to grind perfect points on its flat beaded drills which are used in very tough metals, the new grinder of Hisey-Wolf Machine Co., Cincinnati 25, O., has two holders. The one on the machine's left side grinds the drill point, while the hold-

er on the right is used for thinning the drill web.

Machine will handle flat drills from ½ to 2 inches diameter. Point grinding attachment on left end will also grind ordinary twist drills from ¼ to 2½ inches diameter. Point angle and clearance angle are adjustable. Adjustment is also provided to grind web of flat drills to desired thickness. Diamond dressers are furnished for both wheels.

Check No. 13 on Reply Card for more Details

• • •

ANGLE VISES: Two sizes of angle vises, each available with or without a swivel base, are manufactured by North Bros. Mfg. Co., Philadelphia 33, Pa. Ground on both sides, front end and bottom, they may be used on drill press, milling machine, etc. A 90 degree scale is stamped on the vises for setting at proper angle. Swivel base is locked in place by a lever.

Check No. 14 on Reply Card for more Details

HANDY TIME SWITCH: Type T-47, 35 ampere, 115 and 230 volt time switch, made by General Electric Co., Schenectady 5, N. Y., is timed and operated by a synchronous, self-starting, permanently lubricated Telechron motor. It is designed for on and off timing of a single circuit, performing one cycle each 24 hours continuously.

Check No. 15 on Reply Card for more Details

SMALL CARBIDE MILLS: Severance Tool Industries Inc., 770 Iowa St., Saginaw, Mich., is producing Micro-Mills for rapid internal finishing, available in sizes ⅜-inch and larger and with tapered shanks. Standard internal grinding spindles or quills can be adapted for their mounting by mating two steep tapers and securing the mill with a retaining screw. Carbide tools will grind up to rockwell 62-C hardness.

Check No. 16 on Reply Card for more Details

METAL "PUTTY": Metal processed into a plastic compound containing an acid fluxing agent which etches its way into a metal surface in a manner similar to hot solder is Railmetal waterproof filler, made by Atomized Materials Co., Pittsburgh, Pa. Applied with knife or fingers, it hardens rapidly and may be filed or sanded. It has a bond strength of hundreds of pounds per square inch.

Check No. 17 on Reply Card for more Details

FLEXIBLE HEAD TORCH: Hamilton Tool Co., Hamilton, O., is announcing the Cristorch, a welding and cutting torch with a flexible head which may be revolved 180 degrees. Metal of thicknesses from 1/32 to 4 inches may be cut and holes from ⅜ to 30 inches with 1/64-inch accuracy. Other uses include grooving, countersinking, beveling and cutting heads from rivets with a blemish on the surface of the work area.

Check No. 18 on Reply Card for more Details

SAFETY JACK SUPPORT: Aluminum alloy is used in the manufacture of the No. JS-1 safety jack support for general industrial use, announced by Templeton, Kenly & Co., Chicago 44, Ill. Support height is 15 inches and platform height is 7 x 10 inches. They may be used upright or inverted.

Check No. 19 on Reply Card for more Details

BLASTING NOZZLES: Available with either Kirksite or steel jackets, Super Titan blasting nozzles, developed by Mills Alloys Inc., Los Angeles 2, Calif., are offered in lengths from 1 to 6 inches and with bores from 1/16 to ⅝-inch. Tungsten carbide liners withstand abrasive action of material used for cleaning purposes.

Check No. 20 on Reply Card for more Details

PLASTIC PIPE: Made of Kralite, a blend of synthetic rubber and thermoplastic resins, a corrosion-proof pipe, developed by United States Rubber Co., Rockefeller Center, New York, N. Y., can be supplied in rigid and semirigid forms. Sizes range from ¼ to 2 inches outside diameter. It may be bent to various radii and threaded.

Check No. 21 on Reply Card for more Details

BOILER TUBE CLEANER: Lagonda Division of Elliott Co., Springfield, O., is offering an improved swing-frame type cutter head for use in cleaning boiler tubes and for general service. Cutter pin is locked in place by a "keeper". Head consists of a spider fitted with arms which swing out under centrifugal force. Arms carry cutter pins on which are mounted sharp, heat treated cutters.

Check No. 22 on Reply Card for more Details

ASBESTOS GAUNTLET: An improved leather reinforced asbestos gauntlet, made by Industrial Gloves Co., Danville, Ill., has no seam to rip or burn out. It has a continuous leather wearing surface over asbestos palm, fingers and thumb. Twelve and 14 inch lengths, lined and unlined are available.

Check No. 23 on Reply Card for more Details

FLUE GAS ANALYZER: Continuous indicating and recording of stack gases as a guide to more efficient combustion is the function of the flue gas analyzer introduced by Davis Emergency Equipment Co., Newark 4, N. J. It indicates if too much air or insufficient air is provided. Instrument is operated from 110-volt, 60 cycle current.

Check No. 24 on Reply Card for more Details

DIFFERENTIALS: Arma Corp., Brooklyn 32, N. Y., is announcing a line of mechanical differentials for high accuracy application. They are offered in six sizes with shaft diameters from 3/16 to 5/8-inch.

Check No. 25 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

OUTLOOK CONFUSED— The supply outlook for steel is now a confused one as result of the surprising imposition of mandatory government controls on that product last week by Congress.

Tacked on to the draft revival act, the controls rider empowers the President to direct steel producers to supply certain percentages of their output to manufacturers of steel products required by the armed forces. These controls superimposed on current voluntary allocations would mean less steel for other uses, and without knowing yet how widely these controls will be applied, consumers and producers can only speculate as to what the steel distribution pattern for late 1948 will be like.

SUPPLY— Meanwhile, consumers press relentlessly for places on steel order books. Pipe and tubing are particularly in tight supply, and with no easing in sight, some consumer groups, particularly Texas and Oklahoma oil men, are making considerable effort to cover their pipe needs by arranging conversion deals or seeking to acquire or set up pipe fabricating facilities. Similarly, several eastern tubing users are considering installation of tube forming mills but are concerned over availability of strip steel. An increase in the nation's line pipe capacity became effective last week with the first shipment being made from a new mill at Gadsden, Ala. Another company, which proposed to enter the pipe-making field, has been deterred by heavy demand for its plate output.

Flat-rolled carbon products continue in tight supply. Likewise the hot carbon bar supply falls short of requirements of most consumers, regardless of specifications involved. No let-up in demand for bulk of merchant and manufacturers' wire products is seen. However, an easing is noted in some quarters for fine wire specialties, such as tire bead wire. Alloy and stainless steels remain in strong demand, with some of the pressure for the former attributed to substitution of it for carbon steel in filling of oil field pipe requirements.

PRICES— While steel producers and consumers late last week were increasingly hopeful a prolonged interruption to coal production would be averted and thus not impede steel output, they were becoming more certain concessions to miners will be followed with wage increases to steelworkers, with resultant higher steel prices.

STEEL's arithmetical price composites held unchanged last week and compared with those for the corresponding 1947 week as follows: Finished steel, $80.27 and $69.82; semifinished steel, $68.62 and $52.10; steelmaking pig iron, $40.49 (revised) and $32.49; and steelmaking scrap, $40.67 and $35.08.

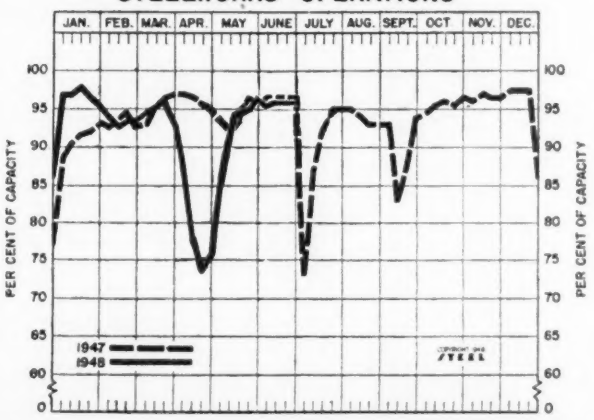
On the price front last week, Connellsville beehive foundry coke advanced 25c a net ton and a $3.75 increase per gross ton effective July 1 was announced for foundry iron from the Mystic furnace at Everett, Mass. To comply with a Federal Trade Commission cease and desist order, refractory brick producers have begun quoting prices f.o.b. plant.

PRODUCTION— Steel ingot production continues high, holding last week at 96 per cent of capacity for the third consecutive week, that rate being equivalent to about 1,732,000 tons.

FOUNDRIES— Many foundries are closing down until July 6 for vacations but will continue to take in pig iron and coke, with the hope they can build enough inventory to improve operations. Use of a high percentage of scrap as a substitute for scarce pig iron has resulted in a substantial volume of rejections of castings by consumers.

SCRAP— With foundries going on vacation and with foundry grades of scrap high-priced some easing in demand for cast grades is noted. Open-hearth grades continue to move freely but July collections are expected to shrink because of mass vacations in many scrap generating plants and also because of reduced steel allotments to consumers.

STEELWORKS OPERATIONS



DISTRICT STEEL RATES

Percentage of Ingot Capacity engaged in Leading Districts

	Week Ended June 26	Change	Same Week 1947	Same Week 1946
Pittsburgh	94.5	— 1	99.5	93.5
Chicago	96	+ 0.5	95.5	88
Eastern Pa.	90.5	None	93	85
Youngstown	103	None	93	86
Wheeling	96.5	+ 2	93.5	85.5
Cleveland	94.5	— 1	91	90.5
Buffalo	99	None	88.5	88.5
Birmingham	100	None	99	99
New England	81	+ 3	90	85
Cincinnati	102	+ 4	87	86
St. Louis	89.5	None	84.5	54.5
Detroit	103	+ 3	88	89
Estimated national rate	96	None	96.5	88

Based on weekly steelmaking capacity of 1,802,476 net tons for 1948; 1,749,928 tons for 1947; 1,762,381 tons for 1946.

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COMPOSITE MARKET AVERAGES

Arithmetical Price Composites*

	June 26	June 19	Month Ago May 1948	Year Ago June 1947	5 Years Ago June 1943
Finished Steel	$80.27	$80.27	$80.27	$69.82	$56.73
Semifinished Steel	68.62	68.62	68.62	52.10	36.00
Steelmaking Pig Iron	40.49	40.49	39.66	32.49	23.00
Steelmaking Scrap	40.67	40.67	40.67	32.48	19.17

FINISHED STEEL WEIGHTED COMPOSITE†

May 1948	3.59469c
Apr. 1948	3.62766c
May 1947	3.11584c
May 1943	2.44941c

***STRAIGHT ARITHMETICAL COMPOSITES:** Computed from average industry-wide base prices on Finished Carbon Steel (hot-rolled sheets, cold-rolled sheets, cold-rolled strip, hot-rolled bars, plates, structural shapes, basic wire, standard nails, tin plate, standard and line pipe), on Semifinished Carbon Steel (rerolling billets and slabs, sheet bars, skelp, and wire rods), on Basic Pig Iron (at eight leading basing points), and on Steelworks Scrap (No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania). Steel arithmetical composites, dollars per net ton; pig iron and scrap, gross ton.

†FINISHED STEEL WEIGHTED COMPOSITE: Computed in cents per pound, base prices, weighted by actual monthly shipments of following products, representing 83 per cent of total steel shipments in the latest month for which statistics are available, as reported by American Iron & Steel Institute: Structural shapes; plates, standard rails; hot and cold-finished carbon bars; black butt weld pipe and tubes; black lap weld pipe and tubes; black electric weld pipe and tubes; black seamless pipe and tubes; drawn wire; nails and staples; tin and terne plate; hot-rolled sheets; cold-rolled sheets; galvanized sheets; hot-rolled strip; and cold-rolled strip. May, 1948, figure is preliminary.

COMPARISON OF PRICES

Representative market figures for current week; average for last month, three months and one year ago. Finished material (except tin plate) and wire rods, cents per lb; semifinished (except wire rods) and coke, dollars per net ton; others dollars per gross ton.

Finished Materials

	June 26, 1948	May 1948	Mar. 1948	June 1947
Steel bars, Pittsburgh	2.875c	2.875c	2.90c	2.60c
Steel bars, del. Philadelphia	3.365	3.365	3.356	2.98
Steel bars, Chicago	2.875	2.875	2.90	2.60
Shapes, Pittsburgh	2.775	2.775	2.80	2.50
Shapes, del. Philadelphia	2.98	2.98	2.968	2.64
Shapes, Chicago	2.775	2.775	2.80	2.50
Plates, Pittsburgh	2.925	2.925	2.95	2.65
Plates, del. Philadelphia	3.21	3.21	3.19	2.85
Plates, Chicago	2.925	2.925	2.95	2.65
Sheets, hot-rolled, Pittsburgh	2.775	2.775	2.80	2.50
Sheets, cold-rolled, Pittsburgh	3.50	3.50	3.55	3.20
Sheets, No. 10 galv., Pittsburgh	3.90	3.90	3.95	3.55
Sheets, hot-rolled, Gary	2.775	2.775	2.80	2.50
Sheets, cold-rolled, Gary	3.50	3.50	3.55	3.20
Sheets, No. 10 galv., Gary	3.90	3.90	3.95	3.55
Strip, hot-rolled, Pittsburgh	3.05	3.05	3.05	2.50
Strip, cold-rolled, Pittsburgh	3.775	3.775	3.80	3.20
Bright basic, bess. wire, Pittsburgh	3.725	3.725	3.775	3.425
Wire nails, Pittsburgh	5.125	5.125	5.20	4.125
Tin plate, per base box, Pittsburgh	$6.60	$6.60	$6.70	$5.75

Semifinished

Sheet bars, Pittsburgh, Chicago	$60.00	$60.00	$60.00	$44.64
Slabs, Pittsburgh, Chicago	45.00	45.00	45.00	37.50
Rerolling billets, Pittsburgh	45.00	45.00	45.00	37.50
Wire rod ⅜ to ¼-inch, Pitts.	3.175c	3.175c	3.175c	2.55c

Pig Iron

	June 26, 1948	May 1948	Mar. 1948	June 1947
Bessemer, del. Pittsburgh (N.&S. sides)	$44.08	$41.038	$40.996	$34.83
Basic, Valley	39.00	39.00	39.00	33.00
Basic, eastern del. Philadelphia	42.17	42.17	42.004	35.52
No. 2 fdry., del. Pgh. (N.&S. sides)	43.58	40.538	40.496	34.33
No. 2 fdry., del. Philadelphia	42.67	42.67	42.504	36.02
No. 2 foundry, Chicago	39.00	39.00	39.00	33.00
No. 2 foundry, Valley	39.50	39.50	39.50	33.50
Southern No. 2, Birmingham	39.38	38.63	37.88	29.88
Southern No. 2, del. Cincinnati	45.09	43.90	41.857	34.75
Malleable, Valley	39.50	39.50	39.50	33.50
Malleable, Chicago	39.50	39.50	39.50	33.50
Charcoal, low phos., fob Lyles, Tenn.	58.00	56.50	55.00	40.50
Ferromanganese, fob cars, Pittsburgh	151.15	151.00	151.00	140.25

Scrap

Heavy melt. steel, No. 1, Pittsburgh	$40.25	$40.25	$40.25	$32.44
Heavy melt. steel, No. 2, E. Pa.	39.00	39.00	39.00	33.38
Heavy melt. steel, No. 1 Chicago	39.25	39.25	38.875	30.75
Heavy melt. steel, No. 1, Valley	40.25	40.25	40.25	34.06
Heavy melt. steel, No. 1, Cleveland	39.75	39.75	39.75	32.38
Heavy melt. steel, No. 1, Buffalo	44.00	43.00	44.00	32.00
Rails for rerolling, Chicago	54.50	51.75	49.625	38.75
No. 1 cast, Chicago	68.50	66.00	66.00	39.50

Coke

Connellsville, beehive furnace	$13.00	$12.94	$12.50	$9.56
Connellsville, beehive foundry	15.50	15.06	14.875	10.75
Chicago, oven foundry, del.	20.75	20.75	19.25	16.10

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per net ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants. Delivered prices do not include the 3 per cent federal tax on freight.

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, open market, $90-$95 per gross ton. Forging quality $46 per net ton, Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown.

Alloy Steel Ingots: Pittsburgh, $56 per gross ton.

Rerolling Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Buffalo, Birmingham, $45 per net ton; Cleveland, $47 per net ton; sales by smaller interests on negotiated basis at $85 per gross ton, or higher.

Forging Quality Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, $54 per net ton.

Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, $66 per gross ton.

Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Youngstown, $60 nom., per net ton; sales in open market $95-$105 per gross ton.

Skelp: Pittsburgh, 2.85-2.90c; Youngstown, 2.90c per lb.

Tube Rounds: Pittsburgh, Chicago, Gary, Cleveland, $69-70 per net ton; some sellers quoting up to $120 per gross ton.

Wire Rods: Pittsburgh, Chicago, Birmingham, ⅜ to ¼-in., inclusive, $2.80-3.55 per 100 lb. ⅜ to #4-in., inclusive, $2.75, Cleveland; Galveston, $2.95; Worcester, $2.90-2.95. San Francisco (base del.), $3.5245.

Bars

Hot-Rolled Carbon Bars (O.H. only) and Bar-Size Shapes under 3-in. (Base 20 tons one size): Pittsburgh, Youngstown, Chicago, Gary, Birmingham, 2.85-2.90c; Cleveland, Buffalo, 2.90c; Detroit, del., 3.11c; eastern Mich., 3.18c New York, del., 3.43c; Phila., del., 3.34-3.39c; San Francisco (base, del.), 3.5845-3.95c; Los Angeles (base, del.), 3.579-3.86c; Seattle, 3.8375-3.85c, base.

Rail Steel Bars: Same basing points as merchant carbon bars. Prices upon application.

Hot-Rolled Alloy Bars (Base 20 tons one size): Pittsburgh, Youngstown, Chicago, Gary, 3.20-3.30c; Canton, Massillon, Buffalo, Bethlehem, 3.30c. (Texas Steel Co. uses Chicago base price as maximum fob Fort Worth, Tex., price on sales outside Texas, Oklahoma.)

Cold-Finished Carbon Bars (Base 40,000 lb): Pittsburgh, Chicago, Gary, Cleveland, Buffalo, 3.45-3.55c; Detroit, del. 3.61c; Toledo, 3.68c.

Cold-Finished Alloy Bars: Pittsburgh, Chicago, Cleveland 4.00-4.10c; Gary, Buffalo, Canton, base 4.10c.

Reinforcing Bars (New Billet): Pittsburgh, 2.70-2.75c; Chicago, Gary, Youngstown, Birmingham, 2.70; Sparrows Point, Buffalo, base 2.75c; San Francisco (base, del.), 3.3345c; Los Angeles (base, del.), 3.329c; Seattle, 3.88c-4.18c base.

Iron Bars: Single refined: Pittsburgh 7.70c (hand puddled), Economy, Pa., 8.65c. Double refined: Pittsburgh 9.75c (hand puddled), Economy, Pa., 10.00c. Staybolt: Pittsburgh 11.25c (hand puddled), Economy, Pa., 10.20c.

Sheets

Hot-Rolled Sheets (18 gage and heavier): Pittsburgh, Chicago, Gary, Birmingham, Youngstown, 2.75-2.80c; Cleveland, Buffalo, Sparrows Point, Ashland, Ky., base, 2.80c; Detroit, del., 3.01c; eastern Mich., del., 3.08c; Philadelphia, del., 3.06c; New York, del., 3.18c; Los Angeles (base, del.), 3.494-3.544c; San Francisco, (base, del.) 3.4995-3.5495c. (Alan Wood Steel Co., Conshohocken, Pa., quotes 4.20c, Sparrows Point equivalent).

Cold-Rolled Sheets: Pittsburgh, Chicago, Gary, 3.45-3.55c; Cleveland, 3.50-3.55c; Middletown, 3.50c; Buffalo, Youngstown, Sparrows Point, 3.55c; Granite City, 3.65c; Detroit, del., 3.66-3.76c; eastern Mich., del., 3.73-3.83c; New York, del., 3.93c; Philadelphia, del., 3.81c.

Galvanized Sheets, No. 10: (Based on 5 cent zinc) Pittsburgh, Gary, Birmingham, 3.85-3.95c; Chicago, Sparrows Point, Canton, Middletown, 3.95c; Kokomo, 4.55c; Youngstown, 3.95-4.45c; Granite City, 4.35c; New York, del., 4.33c; Philadelphia, del., 4.21c; Los Angeles (base, del.), 4.624c; San Francisco (base, del.), 4.6295c.

Corrugated Galvanized Sheets, No. 10 (Based on 5-cent zinc): Pittsburgh, Chicago, 3.95-4.05c; Gary, Birmingham, Canton, Youngstown, Middletown, 3.95c.

Culvert Sheets, No. 16 flat (based on 5-cent zinc; corrugated 10 cents extra): Copper alloy: 4.45-4.55c, Pittsburgh, Gary; 4.55c Chicago; 4.90c, Kokomo; 5.00c, Granite City; 5.344c (base del.), Los Angeles; 5.3495c (base del.), San Francisco.
Copper-iron or pure iron: 4.80-4.90c, Pittsburgh; 4.80c, Gary; 4.90c, Chicago, Canton; 5.35c, Granite City.

Aluminized Sheets: Hot-dipped, coils or cut to lengths: Pittsburgh, 7.50c.

Long Ternes, No. 10: Pittsburgh, Chicago, Gary, base, 4.05c.

Enameling Sheets, No. 12: Pittsburgh, 3.85-3.95c; Chicago, Gary, 3.75-3.95c; Cleveland, Middletown, 3.85c; Youngstown 3.95c-4.45c; Granite City, 4.05c; Detroit, del., 4.16c; eastern Mich., 4.23c.

Electrical Sheets, No. 24: Field: Pittsburgh, Chicago, Gary, 4.40-4.50c; Kokomo, Ind., 4.60c. Armature: Pittsburgh, 4.70-5.30c; Chicago, Gary, 4.70-4.80c; Granite City, Ill., 5.25c; Kokomo, Ind., 4.90c. Electrical: Pittsburgh, 5.20-5.80c; Chicago, Gary, 5.20-5.30c; Granite City, Ill., 5.75c; Kokomo, Ind., 5.40c Motor: Pittsburgh, 5.95-6.80c; Chicago, Gary, 5.95-6.05c; Granite City, 6.50c. Dynamo: Pittsburgh, 6.65-7.00c; Granite City, 7.20c. Transformer 72, 7.15-8.25c; 65, 7.85-9.20c; 58, 8.55-9.90c; 52, 9.35-9.45c, Pittsburgh.

Strip

Hot-Rolled Strip: Pittsburgh, 2.80c-3.30c; Chicago, Gary, Birmingham, Youngstown, Cleveland, 2.75-2.80c; Detroit, del., 3.01c; eastern Mich., del., 3.08c; San Francisco (base, del.), 3.5595c; Los Angeles (base, del.), 3.554c.

Cold-Rolled Strip: 0.25 carbon and less: Pittsburgh, 3.50-4.05c; Cleveland, 3.45-3.85c; Youngstown, 3.55-3.85c; Chicago, Gary, 3.55-3.65c; Detroit, del. 3.66-3.76c; eastern Mich., 3.73-3.83c; Worcester, base, 3.65c.

Cold-Finished Spring Steel: Cleveland base: 0.26-0.40 carbon, 3.55c; over 0.40 to 0.60 carbon, 4.95-5.05c; over 0.60 to 0.80, 5.55-5.65c; over 0.80 to 1.05, 7.05-7.15c; over 1.05 to 1.35, 9.35-9.45c; add 0.20c for Worcester.

Tin, Terne Plate

Tin Plate: Pittsburgh, Chicago, Gary, per base box of 100 lb, 1.25 lb coating $6.50, 1.50 lb coating $6.70; Sparrows Point, Birmingham and Warren, O., $6.60 and $6.80, respectively; Granite City, $6.70 and $6.90, respectively.

Electrolytic Tin Plate: Pittsburgh, Gary, per base box of 100 lb, 0.25 lb tin, $5.70; 0.50 lb tin, $5.90; 0.75 lb tin $6.10; Sparrows Point, Birmingham and Warren, O., $5.80, $6.00, $6.20, respectively; Granite City, $5.90, $6.10, $6.30, respectively.

Can Making Black Plate: Pittsburgh, Gary, per base box of 100 lb, 55 to 70 lb basis weight, $5.10; 75 to 95 lb basis weight, $5.00; 100 to 128 lb basis weight, $5.10. Birmingham and Warren, O., $5.20, $5.10, $5.20, respectively.

Holloware Enameling Black Plate: Pittsburgh, Chicago, Gary, base 29-gage, 4.65c per lb; Sparrows Point, Warren, O., 4.75c; Granite City, 4.85c.

Manufacturing Ternes (Special Coated): Pittsburgh, Chicago, Gary, per base box of 100 lb. $5.80; Granite City, Birmingham, Sparrows Point, $5.90; Granite City, $6.

Roofing Ternes: Pittsburgh, per package 112 sheets; 20 x 28 in., coating I.C. 8-lb $15.30.

Plates

Carbon Steel Plates: Pittsburgh, Chicago, Gary, Birmingham, Youngstown, 2.90-2.95c; Cleveland, Sparrows Point, 2.95c; Coatesville, 3.45c; Claymont, 3.65c; Geneva, Utah, 2.90c; Det., del., 3.21c; New York, del., 3.33c; Phila., del., 3.21c; Boston, del., 3.51c; St. Louis, del., 3.269c; San Francisco and Los Angeles, del., 3.493c for sizes and grades produced at Geneva; 3.76c for sizes and grades produced at Fontana, Calif.
(Central Iron & Steel Co., Harrisburg, Pa., 5.10c, basing points.)

Floor Plates: Pittsburgh, 4.05c; Chicago, 3.95-4.05c; Gary, 3.95c; Cleveland, 4.20c.

Open-Hearth Alloy Plates: Pittsburgh, Chicago, Gary, 3.70c; Coatesville, 4.80c.

Clad Steel Plates: Coatesville, 10% cladding: Nickel clad, 21.50c; inconel-clad, 30.00c; monel-clad, 24.00c.

Wrought Iron: Economy, Pa., 7.25c.

Shapes

Structural Shapes: Pittsburgh, Chicago, Gary, Birmingham, 2.75-2.80c; Buffalo, Bethlehem, 2.80c; New York, del., 3.06c; Phila., del., 2.98c; Geneva, Utah, 2.75c; Los Angeles (base, del.), 3.424-3.474c for sizes produced at Torrance, Calif.; Los Angeles and San Francisco, del., 3.343c for sizes produced at Geneva, 3.81c for sizes produced by Bethlehem in East; San Francisco, del., 3.54c for sizes produced at Fontana, Calif.

Beams, Wide Flange: Pittsburgh, Chicago, 2.70c.

Alloy Structural Shapes: Pittsburgh, Chicago, Gary, 3.45-3.55c.

Steel Piling: Pittsburgh, Chicago, Buffalo, $3.30 per 100 lb.

Wire and Wire Products

(Fob Pittsburgh, Chicago, Cleveland and Birmingham per 100 pounds.)

Wire to Manufacturers in carloads

Bright, basic or bessemer..... *$3.45-4.00
Basic MB Spring (except Birm.)..**$4.85-4.95
Upholstery Spring (except Birm.) †$4.50-4.60

Wire Products to Trade in carloads

Wire, Merchant Quality
Annealed (6 to 8 base).....††$4.10-4.20
Galvanized (6 to 8 base).....††$4.55-4.65
(Fob Pittsburgh, Chicago, Duluth, Birmingham, per base column).

Nails

Standard, cement-coated, galvanized.. ‡91-94
Staples, polished and galvanized..... ‡‡91-94
Woven fence, 15½ gage and heavier. §97-100
Barbed wire, 80-rod spool .....§§111-113
Fence Posts (with clamps)..... ★107
Bale ties, single loop .....★★94-100

* Worcester, $3.55; Duluth, $3.50; San Francisco (base, del.) $4.4645 bright basic only.

** Worcester, $4.95; Duluth & Trenton, N.J., $5.10 (bright only); San Francisco (base del.) $5.8845.

† Worcester $4.60; Duluth and Trenton, N. J., New Haven, Conn., $4.75; San Francisco (base, del.), $5.5345 black upholstery.

†† One producer quotes 25 cents higher at Birmingham and Chicago; Worcester $4.20 annealed, $4.65 galvanized; Cleveland, annealed $4.10, galvanized $4.55; Duluth $4.10 annealed, $4.55 galvanized; Kokomo, Ind., $4.80 annealed, $5.25 galvanized; San Francisco (base, del.) $5.1145 annealed, $5.5645 galvanized.

‡ Cols. 108 and 114 also quoted Pittsburgh; Worcester, Cleveland 97; Duluth, 91; San Francisco (base, del.) 112.

‡‡ Cols. 108 and 114 also quoted Pittsburgh; Worcester 97; San Francisco (base del.) 112.

§ Col. 101 also quoted at Pittsburgh; San Francisco (base del.) 120.

§§ San Francisco (base del.) 131.

★ Duluth, 104.

★★ San Francisco (base del.) 118; Chicago, Birmingham, 94-99.

Rails, Supplies

Rails: Standard, over 60-lb fob mill, $2.70-$2.75 per 100 lb. Light rails (billet), Pittsburgh, Birmingham, $3.05 per 100 lb; light rails (rail-steel), prices upon application.
Relaying, 60 lb and over fob warehouse $60-$65 per net ton.

Supplies: Track bolts, 7.00c; heat treated, 7.25c. Tie plates $3.55-$3.65 per 100 lb, fob mill; $3.40 base. Seattle; $3.70 fob Pittsburg, Calif. Splice bars $3.75-$3.85 per 100 lb fob mill. Standard spikes, 4.85c; screw spikes, 6.75c. Axles 4.45-4.50c.

Tubular Goods

Standard Steel Pipe: Base price in carlots, threaded and coupled, to consumers about $200 a net ton. Base discounts Pittsburgh on all types; Lorain on steel butt weld, and seamless; Gary, Ind., 2 points less on steel lap weld and 1 to 2 points less on steel butt weld on sizes produced in that district.

	Butt Weld				
In.	Blk.	Gal.	In.	Blk.	Gal.
⅛	44½	17	1	52½–53½	36½–37½
¼	44½	21½	1¼	53–54	37–38
⅜	41	17	1½	53½–54½	37½–38½
½	47–48	29½–30½	2	54–55	38–39
¾	50–51	33½–34½	2½, 3..	54½–55½	38½–39½

	Lap Weld		Elec. Weld		Seamless	
In.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
2	44½	28	44	27½	43½	27
2½ & 3	48½	32	47	30½	46½	30
3½-6	50½	34	49	32½	48½	32

Line Steel Pipe: Base price in carlots to consumers about $200 a net ton. Base discounts Pittsburgh and Lorain, O.

In.	Butt Weld	In.	Butt Weld
⅛	43½	1	51½-52½
¼	43½	1¼	52-53
⅜	40	1½	52½-53½
½	46–47	2	53-54
¾	49–50	2½ & 3	53½-54½

In.	Lap Weld	Elec. Weld	Seamless
2	43½	43	42½
2½ & 3	46½	46	45½
3½-6	48½	48	47½
8	50½	50	49½
10	50	49½	49
12	49	48½	48

Standard Wrought Iron Pipe: Base price in carlots, threaded and coupled, to consumers about $200 a net ton. Base discounts Pittsburgh.

	Butt Weld			Lap Weld	
In.	Blk.	Gal.	In.	Blk.	Gal.
⅜	+46½	+74½	1¼	+12	+34½
½	+11	+35	1½	+ 6	+27½
¾	+ 1½	+25	2	— 1½	+20
1 and 1¼	— 4	+16½	2½-3½	— 4	+16
1½	— 9½	+13	4	— 8	+10½
2	—10	+12½	4½-8	— 6	+12
			9-12	+ 3	+21½

Boiler Tubes: Net base c.l. prices, dollars per 100′, fob Pittsburgh; minimum wall thickness, cut lengths 4 to 24″, inclusive.
Prices effective as of May 1, 1948.

		Seamless			Elec. Weld	
O.D. In.	B.W. Ga.	Hot Rolled	Cold Drawn		Hot Rolled	Cold Drawn
1	13	.....	12.21-12.46		11.51	11.51
1¼	13	.....	14.46-14.76		11.48	13.64
1½	13	13.72-14.00	16.14-16.47		12.69	15.22
1¾	13	15.60-15.92	18.37-18.74		14.43	17.31
2	13	17.48-17.84	20.57-20.99		16.17	19.39
2¼	13	19.48-19.88	22.93-23.40		18.02	21.62
2½	12	21.46-21.90	25.25-25.77		19.86	23.80
2½	12	23.51-23.99	27.65-28.21		21.75	26.06
2¾	12	24.91-25.42	29.30-29.90		23.05	27.63
3	12	26.15-26.68	30.77-31.40		24.18	29.00
3¼	11	30.44-31.06	35.82-36.55		28.16	33.77
3½	11	32.68-33.35	38.47-39.26		30.23	36.27
4	10	40.57-41.40	47.73-48.70		37.53	44.99
4½	9	53.77-54.87	63.29-64.58		....	....
5	9	62.25-63.52	73.25-74.71		....	....
6	7	95.56-97.51	112.44-114.73		....	....

Pipe Cast Iron: Class B, 6-in. and over $79.50 per net ton, Birmingham; $84.50, Burlington, N. J.; $91.12, del. Chicago; 4-in. pipe, $5 higher; class A pipe, $5 a ton over Class B.

Bolts, Nuts

Fob Pittsburgh, Cleveland, Birmingham, Chicago; add 19c per cwt in carlots, Lebanon, Pa. Additional discounts: 5 for carloads; 15 for full containers, except tire, step, plow bolts.

Carriage and Machine Bolts

½-in. and smaller; up to 6 in. in length	45 off
⅝ and ⅝ x 6-in. and shorter.....	46 off
¾-in. and larger x 6-in. and shorter.	43 off
All diameters longer than 6-in.....	41 off
Tire bolts	35 off
Step bolts	43 off
Plows bolts	54 off
Lag bolts, 6 in. and shorter.....	46 off
Lag bolts, longer than 6 in.	44 off

Stove Bolts

In packages, nuts separate, 65-10 off; bulk 75 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

Nuts

Semifinished hexagon	A.S. Light	A.S. Reg. and Heavy
7/16-in. and smaller.....	46 off	....
½-in. and smaller.....	.....	44 off
½-in.-1-in.	44 off	....
⅝-in.-1-in.	.....	43 off
1⅛-in.-1½-in.	42 off	41 off
1⅝-in. and larger	.....	35 off

Additional discount of 15 for full containers.

Hexagon Cap Screws (Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright).....	53 off
Upset (1035 heat treated)	
⅝ and smaller x 6 and shorter....	48 off
¾, ⅞, & 1 x 6 and shorter.....	44 off

Square Head Set Screws

Upset 1-in. and smaller.....	57 off
Headless, ¼-in. and larger.....	40 off
No. 10 and smaller	52 off

Rivets

Fob Pitts., Cleve., Chicago, Birmingham	
Structural ½-in. and larger.....	5.65c
Fob Lebanon, Pa.	
Structural ½-in. and larger.....	5.65c*
7/16-in. and larger.....	55 off*

* Plus 19c per cwt in cl.; 26c in lcl.

Washers, Wrought

Fob Pitts., Chicago, Philadelphia, to jobbers and large nut and bolt mfrs.....$1-$2 off

Tool Steels

Tool Steels: Pittsburgh, Bethlehem, Syracuse, Canton, O., Dunkirk, N. Y., base, cents per lb; reg. carbon 16.00-17.00c; extra carbon 20.00c; special carbon 24.00c; oil-hardening 26.00c; high carbon-chromium 47.00c.

W	Cr	V	Mo	Base Per lb
18.00	4	1	...	82.00c
1.5	4	1	8.5	59.00c
12	3	0.50	...	67.00c
6.40	4.15	1.90	5	63.60c
5.50	4.50	4	4.50	80.00c

Stainless Steels

Base, cents per lb, Pittsburgh, Chicago, Cleveland, Bethlehem, Canton, Massillon, Middletown, Watervilet, Dunkirk, Syracuse, Reading, Ft. Wayne, Titusville, Brackenridge, Jersey City, W. Leechburg, Baltimore and Washington, Pa.

Grade	Bars, Wire, Shapes	Plate	Sheets	Hot Rolled Strip	Cold Rolled Strip
CHROMIUM NICKEL STEELS					
301....	26.00c	29.50c	37.00c	22.00c	28.00c
302....	26.00	29.50	37.00	23.50	30.50
303....	28.50	31.50	39.00	29.50	36.00
304....	27.50	31.50	39.00	25.50	32.50
308....	31.50	37.00	44.50	31.00	38.00
309....	39.00	43.50*	51.00*	40.50	51.00
310....	53.50	56.50†	57.50‡	53.00	61.00
316....	43.50	48.00	52.00	43.50	52.00
321....	31.50	37.00	44.50	32.00	41.50
347....	36.00	41.50	49.00	36.00	45.50
431....	21.00	24.00	31.50	19.00	24.50
440A ..	26.00	31.00	36.50	26.00	30.50
STRAIGHT CHROMIUM STEEL					
410....	20.50	23.50	29.00	18.50	24.00
416....	21.00	24.00	29.50	20.00	25.50
420....	26.00	31.00	36.50	26.00	39.50
430....	21.00	24.00	31.50	19.00	24.50
430F ..	21.50	24.50	32.00	20.50	27.00
442, 443	24.50	28.00	35.50	26.00	35.00
446....	30.00	33.00	39.50	38.00	56.50
§501...	9.00	13.00	17.50	13.00	18.50
§502...	10.00	14.50	18.50	14.50	19.50
****STAINLESS CLAD STEEL (20%)**					
304....	....	24.00	22.00	....	....
410....	....	22.00	20.00	....	....
430....	....	22.50	20.50	....	....
446....	....	29.00	27.00	....	....

One producer quotes: * 6.50c higher, † 3.50c higher, ‡ 10.00c higher. § Low chromium. ** Fob Pittsburgh, Washington and Coatesville, Pa.; plate prices include annealing, pickling.

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

Pig Iron

Per Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa., base	$40.00	$40.50	$41.00	$41.50
Newark, N. J., del.	42.39	42.89	43.39	43.89
Brooklyn, N. Y., del.	....	44.40	44.90	....
Philadelphia, del.	42.17	42.67	43.17	43.67
Birmingham, base	38.88	39.38	....	....
Cincinnati, del.	....	45.09	....	....
Buffalo, base	40.00†	40.00†	40.50†	41.00
Boston, del.	48.42	48.42	48.92	....
Rochester, del.	42.22	42.22	42.72	43.22
Syracuse, del.	43.025	43.025	43.525	44.025
Chicago, base	38.50	39.00	39.50	40.00
Milwaukee, del.	40.22	40.72	41.22	41.72
Muskegon, Mich., del.	....	43.98	44.48	....
Cleveland, fob furnace	38.50†	39.00†	39.50†	40.00
Akron, del.	40.67	41.17	41.67	42.17
Duluth, base	39.00	39.50	40.00	40.50
Erie, Pa., base	38.50	39.00	39.50	40.00
Everett, Mass., base	....	48.75	49.25	....
Granite City, Ill., base	45.25	45.75	46.25	....
St. Louis, del.	46.00	46.50	47.00	....
‡**Neville Island, Pa.,** base	42.00	42.50	42.50	43.00
Pittsburgh, del., N.&S. Sides	43.08	43.58	43.58	44.08
Provo, Utah, base	39.00	39.50	....	....
Seattle, Tacoma, Wash., del.	....	46.63	....	....
Portland, Oreg., del.	....	46.63	....	....
Los Angeles, San Francisco.	46.13	46.63	....	....
Sharpsville, Pa., base	39.00	39.50	39.50	40.00
Steelton, Pa., base	40.00	40.50	41.00	41.50
Struthers, O., base	42.50	....	....	....
Swedeland, Pa., base	45.00	45.50	46.00	46.50
Toledo, O., base	38.50	39.00	39.50	40.00
Cincinnati, del.	43.05	43.55	....	....
Youngstown, O., base	39.00	39.50	39.50	40.00
Mansfield, O.	42.87	43.37	43.37	43.87

† Republic Steel Corp. quotes $2.875 higher for No. 2 foundry and malleable and $2.375 higher for basic at Buffalo, and $1.25 higher at Cleveland, effective on shipments during week ended June 27.

‡ To Neville Island base add: $0.86 for McKees Rocks, Pa.; $1.31 Lawrenceville, Homestead, McKeesport, Monaco; $1.73 Verona; $1.94 Brackenridge; $1.08 to Ambridge and Aliquippa.

Blast Furnace Silvery Pig Iron

6.00-6.50 per cent Si (base)..$53.50
6.51-7.00..$54.75 9.01- 9.50. 61.00
7.01-7.50.. 56.00 9.51-10.00. 62.25
7.51-8.00.. 57.25 10.01-10.50. 63.50
8.01-8.50.. 58.50 10.51-11.00. 64.75
8.51-9.00.. 59.75 11.01-11.50. 66.00

Fob Jackson, O., per gross ton. Buffalo base $1.25 higher. Buyer may use whichever base is more favorable.

Bessemer Ferrosilicon

Prices same as for blast furnace silvery iron, plus $1 per gross ton.

Electric Furnace Silvery Pig Iron

Si 14.01-14.50%, $78.75, Niagara Falls; $78 open-hearth and $79 foundry grade, Keokuk, Iowa. Add $1 a ton for each additional 0.5% Si to 18%; 50c for each 0.05% Mn over 1%; $1 a ton for 0.045% max. phos.

Charcoal Pig Iron

Semi-cold blast, low phosphorus. Fob furnace, Lyles, Tenn.....$58 (For higher silicon iron a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Gray Forge

Neville Island, Pa. $42.00

Low Phosphorus

Steelton, Pa., Buffalo, Troy, N. Y., $46.00. Philadelphia, $48.81, delivered. Intermediate phosphorus, Central furnace, Cleveland, $42.00.

Differentials

Basing point prices are subject to following differentials:

Silicon: An additional charge of 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

Phosphorus: A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.

Manganese: An additional charge of 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

Nickel: An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, $2 a ton; for each additional 0.25% nickel, $1 a ton.

Metallurgical Coke

Price per Net Ton

Beehive Ovens

Connellsville, furnace..$12.00-$14.00
Connellsville, foundry.. 14.50- 16.50
New River, foundry... 15.50
Wise county, foundry.. 14.25
Wise county, furnace.. 13.50

Oven Foundry Coke

Kearney, N. J., ovens. $20.50
Chicago, outside del... 19.50
Chicago, del. 20.75
Terre Haute, ovens.... 20.25
Milwaukee, ovens 20.25
New England, del. 21.75
Birmingham, del. 16.71
Indianapolis, ovens ... 20.10
Cincinnati, del. 20.50
Ironton, O., ovens 18.25
Erie, Pa., del. 21.55
Painesville, O., ovens.. 20.00
Cleveland, del. 21.55
Buffalo, del. 21.75-22.20
Detroit, del. 20.50-20.75
Philadelphia, ovens ... 19.55
Swedeland, Pa., ovens. 19.50
Portsmouth, O., ovens. 18.25

Coal Chemicals

Spot, cents per gallon

Pure and 90% benzol ..... 21.00†
Toluol, two degrees 28.00
Industrial xylol 28.00
Solvent naphtha 28.00

Per pound fob works

Phenol (car lots, returnable drums) 13.00
Do., less than carlots 13.75
Do., tank cars 12.00

Eastern plants, per pound

Naphthalene flakes, balls, bbl. to jobbers, "household use" 12.00

Per ton, bulk, fob plants

Sulphate of ammonia.....$40.00

† Freight allowed up to 2 cents.

Refractories

(Base prices per 1000, fob plant)

Fire Clay Brick

Super Duty: St. Louis, $92.
High-Heat Duty: Salina, Pa., $78; St. Louis, Mo., West Decatur, Orviston, or Beach Creek, Pa., Olive Hill, Hitchins, or Haldeman, Ky., Troup, Tex., Stevens Pottery, Ga., Oakhill, O., $73.
Intermediate-Heat Duty: St. Louis, Mo., West Decatur, Orviston, or Beach Creek, Pa., Olive Hill, Hitchins, or Haldeman, Ky., Troup, Tex., Stevens Pottery, Ga., $67.
Low-Heat Duty: Oak Hill, O., $59.

Ladle Brick

Dry Press: $50.
Wire Cut: $48.

Malleable Bung Brick

St. Louis, Mo., Olive Hill, Ky., $83; Beach Creek, Pa., $73.

Silica Brick

Mt. Union, Claysburg, Sproul, Pa., $73; Joliet or Rockdale, Ill., $82; Lehi, Utah, Los Angeles, $88.
Eastern Silica Coke Oven Shapes: Claysburg, Mt. Union, Sproul, Pa., $69.
Illinois Silica Coke Oven Shapes: Joliet or Rockdale, Ill., $70.

Basic Brick

(Base prices per net ton); f.o.b. works, Baltimore)
Chrome brick or chemical-bonded chrome brick, $64; magnesite brick, $86; chemical-bonded magnesite, $75.

Magnesite

(Base prices per net ton, fob works, Chewelah, Wash.)
Domestic dead-burned, ⅜" grains: Bulk, $31; single paper bags, $35.50.

Dolomite

(Base prices per net ton)
Domestic, dead-burned, bulk: Billmeyer, Blue Bell, Williams, Pa., Millville, W. Va., Narlo, Millersville, Martin, Gibsonburg, Woodville, O., $11.85; Thornton, McCook, Ill., $11.95; Dolly Siding, Bonne Terre, Mo., $12.05.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural) Lower Lake Ports

(Any increase or decrease in R. R. freight rates, dock handling charges and taxes thereon effective after Apr. 1, 1948, are for buyer's account.)

Old range bessemer $6.60
Old range nonbessemer 6.45
Mesabi bessemer 6.35
Mesabi nonbessemer 6.20
High phosphorus 6.20

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56.62% contract 15.25

Foreign Ore

Cents per unit, cif Atlantic ports

No. African low phos.... Nom.
Swedish basic, 60 to 68%.13.50-14.00
Spanish, No. African basic, 50 to 60%..... Nom.
Brazil iron ore, 68-69% fob Rio de Janeiro, nom. 5.50-6.50

Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid ..... $26-$28

Manganese Ore

48-50%, duty paid, fob cars, New York, Philadelphia, Baltimore, Norfolk, Va., Mobile, Ala., New Orleans, 67.60c-72.60c.

Chrome Ore

Gross ton fob cars, New York, Philadelphia, Baltimore, Charleston, S.C., plus ocean freight differential for delivery to Portland, Oreg., and/or Tacoma, Wash. (S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African
48% 2.8:1 ..... $37.50
48% 3:1 ..... 39.00
48% no ratio 31.00

South African (Transvaal)
44% no ratio .....$25.50-$26.00
45% no ratio 26.50
48% no ratio 29.00-30.00
50% no ratio 29.50-30.50

Brazilian—nominal
44% to 2.5:1 lump..... $33.65

Rhodesian
45% no ratio .....$27-$27.50
48% no ratio 30.00
48% 3:1 lump 39.00

Domestic (seller's nearest rail)
48% 3:1 ..... $39.00

Molybdenum

Sulphide conc., lb., Mo., cont., Mines $0.75

Fluorspar

Metallurgical grade, fob shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $35; less than 60% $32.

HIGH STRENGTH—LOW-ALLOY STEELS

Prices in dollars per 100 pounds

	Pittsburgh	Chicago	Gary	Youngstown	Sparrows Point	Buffalo	Cleveland	Bethlehem	Canton Massillon
Sheet, Hot-Rolled	4.20	4.20–4.30	4.20–4.30	4.20–4.30	4.30	4.30	4.20	...	...
Cold-Rolled	5.20	5.20–5.30	5.20–5.30	5.20–5.30	...	5.30	5.20	...	...
Galvanized	5.90	.....	.....	.....	...	6.00	...	...	...
Strip, Hot-Rolled	4.20	4.30	4.20–4.30	4.20–4.30	...	...	4.20	...	...
Cold-Rolled	5.20	5.30†	5.30†	5.30	...	...	5.20	...	...
Shapes, Structural	4.20	4.20–4.30	4.20	4.30	...	...	...	4.30	...
Plates	4.45	4.45–4.55	4.45–4.55	.....	4.55	...	...	...	...
Bars, Small Shapes	4.35	4.35–4.45	4.35–4.45	4.35–4.45	...	4.45	...	...	4.45

† Nax High Tensile, produced by Great Lakes Steel Corp., quoted 10 cents higher.

WAREHOUSE STEEL PRICES

Prices, cents per pound, for delivery within switching limits, subject to extras.

	SHEETS			STRIP		BARS				PLATES	
	H-R 10 Ga.	C-R 17 Ga.	Gal. *10 Ga.	†H-R	†C-R	H-R Rds. ⅝" to 3"	C-F Rds. ½" & up	H-R Alloy **4140	Structural Shapes§§	Carbon ⅜"-¾"	Floor ¾" & Thicker
Boston (city) ..	5.08	5.84[4]	6.28[4]	5.64	6.90	5.09	5.96	7.70	4.94	5.23	6.89
Boston (c'try)..	4.98	5.64[4]	6.08[4]	5.44	...	4.89	...	...	4.74	5.03	6.69
New York (city)	4.94	5.80	6.13	5.58	...	5.05	5.78	7.23	4.77	5.09	6.58
New York (c'try)	4.79	5.65	5.98	5.43	...	4.90	...	...	4.62	4.94	6.43
Phila. (city)...	4.87	5.81	5.92	5.36*†	...	4.91	5.73	7.30	4.59	4.87	6.36
Phila. (c'try.)..	4.72	5.66	5.77	5.21*†	...	4.76	...	...	4.44	4.72	6.21
Wash. (city) ..	4.81	...	...	5.08	...	5.14	5.79	...	4.98	5.03	6.68
Wash. (c'try.) .	4.71	...	...	4.98	...	5.04	...	...	4.88	4.93	6.58
Balt. (city) ...	4.27†	5.59	5.62	4.79	...	4.84	5.66	...	4.69	4.72	6.09
Balt. (c'try.) .	4.12†	5.44	5.40	4.64	...	4.69	...	...	4.54	4.57	5.94
Norfolk, Va. ..	4.90	...	...	...	...	5.20	6.00	...	5.15	5.15	6.90
Memphis (city)	4.91[20]§	5.98[8]†	...	5.11[20]	...	5.01[20]	5.88	...	5.01[20]	5.21[20]	6.83[20]
Memphis (c'try)	4.81[20]§	5.88[8]†	...	5.01[20]	...	4.91[20]	5.78	...	4.91[20]	5.11[20]	6.73[20]
Buffalo (city) .	4.25	5.20[5]	6.05	5.25	5.97	4.40	5.10	6.85	4.40	5.00	6.25
Buffalo (c'try.)	4.10	5.05[5]	5.50	4.70	5.82	4.25	4.95	6.85	4.25	4.45	5.75
Pitts. (city) ..	4.20-4.25§	5.05-5.10[8]†	5.60-5.65	4.30-4.35	5.35	4.35-4.40	5.05-5.10	6.70	4.35-4.40	4.55	5.90
Pitts. (c'try) ..	4.05-4.10§	4.85-4.95[8]†	5.40-5.50	4.15-4.20	5.20	4.20-4.25	4.85-4.95	6.70	4.20-4.25	4.40	5.75
Cleve. (city) ..	4.40-4.90	5.10-5.75[8]	5.74-6.45	4.52	5.25	4.35-4.40	5.00-5.10	7.14	4.67	4.55-4.60	5.80-5.90
Cleve. (c'try.) .	4.25-4.90	4.95-5.75[8]	...	...	5.10	4.20-4.25	4.85-4.95	...	...	4.40-4.45	5.65-5.75
Cincinnati	4.51-4.66	5.22	5.77	4.80	6.00	4.76	5.59	...	4.80	4.96	6.21
Indianapolis ...	4.52	5.01[8]	5.96	4.62	5.87	4.67	5.52	8.85	4.67	4.87	6.17
Chicago (city) .	4.40	5.10[8]	5.55-5.65	4.30	5.35	4.35	5.00	6.70[9]	4.35	4.55	5.80
Chicago (c'try.)	4.25	4.95[8]	5.40-5.50	4.15	5.20	4.20	4.85	6.70[9]	4.20	4.40	5.65
Milwaukee	4.62	5.32[8]	5.77-5.87	4.52-5.02	5.57	4.57	5.334	7.184[9]	4.57	4.77	6.02
St. Paul, Minn..	4.66[6]	5.56[8]†	6.01[8]	4.76	6.29[12]	4.81[6]	5.94[11]	7.84[11]	4.81[6]	5.01[6]	6.26[6]
St. Louis	4.79	5.49[8]	6.27	5.24	5.97	4.74	5.62[12]	8.97	4.74	4.94	6.19
Birming. (city).	4.45[20]§	...	5.65	4.45[20]	...	4.40[20]	6.09[22]	...	4.40	4.65	6.99
Birming. (c'try.)	4.30[20]§	...	5.50	4.30[20]	...	4.25[20]	...	...	4.25	4.50	...
Houston, Tex. .	5.75	...	7.36	6.00	...	5.70	7.00	9.25[9]	5.70	5.90	7.20
Omaha, Nebr...	5.31	...	6.76	5.41	...	5.46	6.96	...	5.41	5.66	6.65
Los Angeles ...	5.70§	7.25[8]	7.30	6.00	8.60	5.45	7.25[1]	9.40[23]‡‡	5.15-5.30	5.35	7.40
Seattle-Tacoma.	5.45[17]§	7.25[8]‡	7.10	6.15[17]	...	5.65[17]	7.35[1]	8.70[12]	5.30[17]	5.60[17]	7.65[17]

Base Quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold finished bars, 1000 lb and over; galvanized sheets, 450 to 1499 lb; [1]—1500 lb and over; [2]—1000 to 4999 lb; [3]—450 to 39,999 lb; [4]—three to 24 bundles; [5]—450 to 1499 lb; [6]—400 to 14,999 lb; [8]—400 to 1499 lb; [9]—1000 to 1999 lb; [11]—1000 to 39,999 lb; [12]—1000 lb and over; [16]—2000 lb and over; [17]—300 to 9999 lb; [18]—1500 to 1999 lb; [19]—1500 to 39,999 lb; [20]—400 to 3999 lb; [21]—400 lb and over; [22]—500 to 1499 lb.

* Includes gage and coating extra, except Birmingham (coating extra excluded); † does not include gage extras; ‡ 15 gage; § 18 gage and heavier; ** as rolled; †† add 0.40 for sizes not rolled in Birmingham; ‡‡ annealed; §§ except wide flange beams, which are 0.05c lower; 12G. & heavier and includes machine straightening.

PRICES OF LEADING FERROALLOYS PRODUCTS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si) Carlot per gross ton, $52, Palmerton, Pa., $51, Pittsburgh; (16% to 19% Mn.) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.). Carload, lump, bulk $145 per gross ton of alloy, carload packed $157, ton lot $172, less ton $189, fob New Orleans, Mobile, Philadelphia, Baltimore, New York. Carload, lump, bulk, $150 fob Rockwood, Tenn.; $150.50 fob Aetna, Pa., or $151.15 within Pittsburgh switching limits. Add or subtract $1.80 for each 1%, or fraction thereof, of contained manganese over 82% or under 78%. West Coast Prices: Carload (80,000 lb or more), lump, bulk, same price and basing points as above. All other prices for shipment from Pacific Coast warehouses, add $26.21 to above prices. Delivery is fob Portland, Los Angeles, South San Francisco, or Seattle warehouses, with railroad freight allowed on shipments of 25 gross tons or more.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Eastern Zone, carload, lump, bulk, max. 0.10% C, 22.5c per lb of contained Mn, carload packed 23.25c, ton lot 24.35c, less ton 25.55c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 0.75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Eastern Zone, carload, lump, bulk 16.5c per lb of contained Mn, carload packed 17.25c, ton lot 18.35c, less ton 19.55c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Eastern Zone, carload, 2" x D, bulk 32c per lb of metal, carload packed 32.5c, ton lot 34c, less ton 36c; Central, add 1c for c.l. and 1.45c for l.c.l.; Western, add 1.45c for c.l. and 2.4c for l.c.l. Freight allowed. Spot, add 2c.

Silicomanganese: (Mn 65-70%). Eastern Zone, contract, lump, bulk, 1.50% C grade, 17-20% Si, 7.8c per lb of alloy, carload packed, 8.55c, ton lot 9.45c, less ton 10.45; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. For 2.0% C grade, Si 15-17%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Eastern Zone, contract, c.l., lump, bulk 18.6c per lb of contained Cr, c.l., packed 19.5c, ton lot 20.65c, less ton 22.05c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Eastern Zone, contract, c.l., 8MxD, bulk 20.1c per lb of cotnained Cr, c.l., packed 21.0c, ton lot 22.35c, less ton 24.1c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Eastern Zone, contract, carload, lump, bulk, max. 0.03% C 28.5c per lb of contained Cr, 0.04% C 27.5c, 0.05% C 27.0c, 0.06% C 26.5c, 0.10% C 26.0c, 0.15% C 25.5c, 0.20% C 25.25c, 0.50% C 25.0c, 1% C 24.5c, 2% C 24.25c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, add C 1.25% max.). Eastern Zone, contract, carload, lump, bulk 25c per lb of contained chromium, carload, packed 26.1c, ton lot 27.3c, less ton 29.1c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 2c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 2c for each 0.25% of N above 0.75%.

Chromium Metal: (Mn. 97% Cr and 1% Fe). Eastern Zone, contract, carload, 1" x D; packed, max. 0.50% C grade, 93c per lb of contained chromium, ton lot 94.5c, less ton 97c; Central, add 1.5c for c.l. and 2.5c for l.c.l.; Western, add 2.75c for c.l. and 4.5c for l.c.l. Freight allowed. Spot, add 5c.

SILICON ALLOYS

20-30% Ferrosilicon: Contract, carload, lump, bulk, 16.50c per lb. of contained Si, fob Niagara Falls, N. Y.

50% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 9.3c per lb of contained Si, carload packed 10.9c, ton lot 12.35c, less ton 14.0c; Central, add 0.5c for c.l. and 1.25c for l.c.l.; Western, add 0.7c for c.l. and 1.8c for l.c.l. Freight allowed. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (All 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 11.8c per lb of contained Si carload packed 13.1c, ton lot 14.25c, less ton 15.5c; Central, add 0.3c for c.l. add 0.75c for l.c.l.; Western, add 1.05c for c.l. and 5c for l.c.l. Freight allowed. Spot, add 0.3c.

85% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 13.3c per lb of contained Si, carload packed 14.55c, ton lot 15.55c, less ton 16.7c; Central, add 0.3c for c.l. and 0.7c for l.c.l.; Western, add 1.05c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

90% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk, 15c per lb of contained Si carload packed 16.2c, ton lot 17.15c, less ton 18.2c; Central, add 0.3c for c.l. and 0.65c for l.c.l.; Western, add 1c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Over 97% Si and 1% max. Fe.) Eastern Zone, c.l., lump, bulk, regular 17.3c per lb of Si, c.l. packed 18.5c, ton lot 19.4c, less ton 20.4c; Central, add 0.6c for c.l. and 2.25c for l.c.l.; Western, add 1.2c for c.l. and 4c for l.c.l. Add 1c for max. 0.20% calcium grade. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing over 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract basis fob Niagara Falls, N. Y., lump per lb cl 6.90c; ton lots packed, 7.40c; 200 to 1999 lb, 8.15c; smaller lots 8.65c. Spot up 0.5c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Eastern Zone, contract, carload, bulk, 12.5c per lb or briquet, carload packed 13.2c, ton lot 14.0c, less ton 14.9c; Central, add 0.25c for

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Secondary Metal Prices Move Higher

85-5-5-5 brass ingots advance ½ to ¾-cent a pound while foundry and steel mill grades of remelt aluminum rise ¾ to 1-cent. Copper wire market higher

New York — Price tone of nonferrous metal markets remained strong last week, advances being posted for secondary aluminum, brass and bronze ingots, and copper wire. Primary metals held unchanged.

Copper — Bookings in the domestic copper market were light last week since leading producers have committed themselves for practically all metal in sight for July delivery. In the export market, a moderate volume of business was done at prices ranging from 21.50c to 22.25c, f.a.s. New York.

Copper Wire — Wage advances now being granted or negotiated in the wire and cable and brass mills are exerting an upward pressure on fabricated copper product prices. General Cable Corp. increased prices, effective June 24, "by a weighted average slightly in excess of 5 per cent, with individual product classes ranging from no increase on many items to a maximum of 13 per cent on certain ones. Labor is an appreciable percentage of our overall costs and, when supplemented by other increases, imposes this price necessity upon us."

General Cable's new copper wire prices per pound, fob eastern mills plus usual freight charges, are as follows: Bare wire, soft, 28.37½c for carlots, 28.87½c for less than carlots, and 28.25c for lots of 100,000 pounds; weatherproof wire, soft, 29.00c for carlots, 29.50c for less than carlots, 28.75c for 100,000 pound lots. Magnet wire prices, delivered to any destination in the United States, are as follows: 31.50c for carlots, 31.75c for 15,000 pounds or more, 32.25c for less than carlots.

The company recently reached agreements with workers at its Bayonne and Perth Amboy, N. Y., and St. Louis plants for a wage increase of 8 per cent with a minimum raise of 9 cents an hour.

Brass Ingot — Two leading producers of brass and bronze ingots advanced prices ½-cent to 3/4-cent a pound last week on 85-5-5-5 ingots, widening the price spread to ½-cent. No. 115 ingot of the 85-5-5-5 group is now quoted 19.50c to 20.00c.

The advance in brass ingot prices reflects chiefly the recent rise in scrap quotations. Their buying prices have been raised to the following levels: 15.00c to 15.25c for No. 1 composition, 14.75c to 15.00c for composition turnings, 12.50c to 12.75c for auto radiators, 10.75c to 11.00c for heavy yellow brass, 11.50c to 11.75c for rolled brass, and 11.75c to 12.00c for brass pipe.

Copper refiners' buying prices also are higher at 18.50c to 18.75c for No. 1 copper wire, delivered refinery.

Lead — Demand for lead continued heavy last week for prompt and July delivery, but inquiry was only partially satisfied due to the shortage of metal. Whereas consumers last year were able to get emergency needs filled through the reserves held by the Office of Metals Reserve, this agency can no longer be considered a possible source. As of May 31, OMR held only 2092 tons, unchanged from the total reported a month earlier.

Production by smelters has been restricted recently by the supply of scrap. In an effort to bring out larger tonnages of battery plates, they have been reducing the smelting charge on that material, now being about $15 a ton in the East and as low as $10 a ton in the Midwest.

Effective as of June 20, the tariff on lead has been suspended until June 30, 1949. Excluded from the tariff suspension are semimanufactured products, such as type metals, babbitt metal, solder, lead in sheets, etc.

Zinc—Although slab zinc prices held unchanged last week on the basis of 12.00c, East St. Louis, for prime western, the undertone was unusually strong. Many market observers anticipate an advance in prices in the near future. Independent producers in the Tri-State district have been withholding large tonnages recently, expecting smelters to raise prices momentarily.

Office of Metals Reserve held 75,664 tons of zinc as of May 31 compared with 79,085 tons on Apr. 30, a drop of 3421 tons.

New Jersey Zinc Co. has notified its zinc pigment customers that it can hold its prices firm only for one month ahead, due to present highly uncertain conditions in metals generally. Previously the company had guaranteed prices three months in advance.

Antimony—Stocks of antimony held by the Office of Metals Reserve on May 31 totaled 5831 tons, a reduction of 60 tons from the stocks on hand a month earlier. Of the 5831 tons held by OMR on May 31, 215 tons represented content in ore. Of the Apr. 30 total, 5676 tons were metal and 215 tons in ore.

Tin—Reconstruction Finance Corp. has been authorized to operate the Texas City tin smelter for two years to June 30, 1951. There has been no announcement, however, on what arrangements have been made for its actual operation. It is probable that the Tin Processing Corp., a wholly owned subsidiary of the Billiton Co., will be retained to operate the smelter on a management fee basis from the government. Billiton is understood to be ready to present a program for the permanent operation of the smelter on a basis which it believes will assure a continued supply of ores to the smelter and the establishment of a tin smelting industry in the United States which ultimately may be able to operate without government assistance. Protection in the form of a 3-cent a pound duty on refined tin would be required to justify its operation by private industry during the early years of operation.

J. A. Martino, president, National Lead Co., submitted a letter to the congressional committee which held hearings on the tin smelter proposals, saying that his company "is desirous of leasing the Texas City Smelter under any reasonable terms which will make possible economic operation of the facilities and stands ready to cooperate in every possible manner to aid Congress and branches of the government in solving this problem."

Aluminum — Remelt aluminum smelters advanced their prices for foundry and steel mill grades from ¾-cent to 1-cent a pound last week. The advance resulted from a combination of factors, including higher prices being paid for aluminum scrap, the reduction in production due to curtailments in the recently flooded northwest, and the unsatisfactory labor outlook facing the primary producers. Demand for secondary aluminum continues far in excess of the industry's capacity.

Zinc Scrap Use Gains, Bureau of Mines Reports

WASHINGTON — Consumption of zinc scrap in zinc-base products increased 874 short tons (4 per cent) in December, nearly balancing the 1107-ton (5 per cent) decrease in November, according to the Bureau of Mines. Consumers' receipts of zinc scrap in December were approximately equal to the quantity consumed with the result that inventories remained virtually unchanged.

Consumption of galvanizers' dross totaled 5566 tons in December, representing an increase of 16 per cent over the quantity used in November. This item generally comprises a quarter of the total scrap consumption and is always the largest classification. Use of skimmings and ashes increased 323 tons or 8 per cent in December, that of sal skimmings 372 tons or 18 per cent, and die-cast skimmings 166 tons or 17 per cent. Consumption of flue dust, chemical residues, and die castings dropped 2 per cent, 24 per cent, and 5 per cent, respectively.

Total secondary zinc recovered in December was 14,128 tons compared with 13,517 tons in November. Recovery of zinc in redistilled slab, the largest secondary product, increased 4 per cent. Moderate gains in output of remelt die-cast slab, zinc dust, zinc sulfate, zinc ammonium chloride, and zinc chloride were also recorded. Production of remelt spelter remained virtually unchanged.

Total zinc scrap consumption in 1947, according to preliminary figures, was 241,252 tons, an average of 20,104 tons per month, compared with 206,876 tons in 1946, an average of 17,240 tons per month. The use of all zinc-base scrap items, with few exceptions, increased in 1947.

Recovery of secondary zinc in all zinc-base products totaled 159,758 tons in 1947 and 136,473 tons in 1946. These figures exclude secondary zinc recovered in brass, bronze and aluminum alloys, which in 1946 constituted 55 per cent of the total zinc recovered from scrap.

NONFERROUS METAL PRICES

(Cents per pound, carlots, except as otherwise noted)

Copper: Electrolytic, 21.50c, Conn. Valley; Lake, 21.62½c Conn. Valley.

Brass Ingot: 85-5-5-5 (No. 115) 19.50-20.00c; 88-10-2 (No. 215) 29.00c; 80-10-10 (No. 305) 25.25c; No. 1 yellow (No. 405) 15.25-16.00c. Prices include 25 cents per 100 lb freight allowance.

Zinc: Prime western 12.00c, brass special 12.25c, intermediate 12.50c, East St. Louis; high grade 13.00c, delivered.

Lead: Common 17.30-17.35c; chemical and corroding 17.40c, St. Louis.

Primary Aluminum: 99% plus, ingots 15.00c, pigs 14.00c; metallurgical 94% min. 13.50c. Base prices for 10,000 lb and over, fob shipping point, freight allowed.

Secondary Aluminum: Piston alloy (No. 122 type) 20.50-21.50c; No. 12 foundry alloy (No. 2 grade) 20.50-20.75c; steel deoxidizing grades, notch bars, granulated or short: Grade 1, 21.75-22.50c; grade 2 20.75-21.75c; grade 3, 21.00-21.25c; grade 4 19.75-20.75c. Prices include freight at carload rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over, 20.50c, fob Freeport, Tex.

Tin: Grade A, 99.8% or higher (including Straits) $1.03; grade B, 99.8% or higher, not meeting specifications for grade A, with 0.05% max. arsenic, $1.028; grade C, 99.65-99.79%, incl., $1.024; 99.5-99.649% $1.024, grade F, 98-98.999% $1.015 for tin content. Prices are ex-dock, New York, in 5-ton lots.

Antimony: American 99-99.8% and over but not meeting specifications below, 35.00; 99.8% and over (arsenic 0.05% max.; other impurities, 0.1% max.) 35.50c, fob Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 33.75c; 25-lb pigs, 35.25c; shot, 36.25c; "F" nickel shot or ingots, for addition to cast iron, 34.25c. Prices include import duty.

Mercury: Open market, spot, New York $76-$78 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $20.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, $1.75, del.; Special or patented shapes, $1.80.

Cobalt: 97-98%, $1.65 per lb for 550 lb (keg); $1.67 per lb for 100 lb (case); $1.72 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 74.62½c per ounce.

Platinum: $75-$78 per ounce.

Palladium: $24 per troy ounce.

Iridium: $100-$110 per troy ounce.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, fob mill.)

Sheet: Copper 33.68c; yellow brass 30.16c; commercial bronze, 95% 33.80c, 90% 33.27c; red brass, 85% 32.23c, 80% 31.70c; best quality 31.09c; Everdur, Duronze, Herculoy or equiv., hot-rolled, 38.56c; nickel silver, 18%, 42.42c; phosphor bronze, grade A, 5%, 52.70c.

Rods: Copper, hot rolled 30.03c, cold drawn 31.03c; yellow brass, free cutting, 24.69c; commercial bronze, 95% 33.49c, 90% 32.96c; red brass, 85% 31.92c, 80% 31.39c.

Seamless Tubing: Copper 33.72c; yellow brass 32.92c; commercial bronze 90% 35.68c; red brass 85% 34.89c, 80% 34.36c.

Wire: Yellow brass 30.45c; commercial bronze, 95% 34.09c, 90% 33.56c; red brass, 85% 32.52c, 80% 31.99c; best quality brass 31.38c.

Copper Wire: Bare, soft, fob eastern mills, c.l. 26.80-28.37½c, l.c.l. 27.30-28.87½c; weatherproof, fob eastern mills, c.l. 27.35-29.00c, l.c.l. 27.85-29.50c; magnet, delivered, c.l. 29.75-31.50c, 15,000 lb or more 30.00-31.75c, l.c.l. 30.50-32.25c.

ALUMINUM

(Base prices, fob shipping point)

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	24.0	...	...
0.135-0.126	12-48	24.5	...	...
0.125-0.096	12-48	24.5	23.1	26.3
0.095-0.077	12-48	25.0	23.2	26.5
0.076-0.061	12-48	25.5	23.4	26.7
0.060-0.048	12-48	25.7	23.6	27.0
0.047-0.038	12-48	26.1	23.8	27.3
0.037-0.030	12-48	26.4	24.1	27.7
0.029-0.024	12-48	26.8	24.4	28.1
0.023-0.019	12-36	27.4	24.8	28.6
0.018-0.017	12-36	27.9	25.3	29.3
0.016-0.015	12-36	28.6	25.9	30.1
0.014	12-24	29.4	26.6	31.1
0.013-0.012	12-24	30.2	27.3	32.0
0.011	12-24	31.1	28.1	33.1
0.010-0.0095	12-24	32.1	29.0	34.3
0.009-0.0085	12-20	33.2	30.0	35.7
0.008-0.0075	12-20	34.4	31.1	37.1
0.007	12-18	35.7	32.3	38.8
0.006	12-18	37.0	33.5	42.6

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T	17S-T	—Hexagonal— R317-T	17S-T
0.125	45.0	44.0	...	...
0.156-0.203	38.5	37.5	...	...
0.219-0.313	35.5	34.5	...	...
0.344	34.0	33.0	...	...
0.375	33.0	32.0	42.5	40.0
0.406	33.0	32.0	...	...
0.438	33.0	32.0	42.5	40.0
0.469	33.0	32.0	...	...
0.500	33.0	32.0	42.5	40.0
0.531	33.0	32.0	...	...
0.563	33.0	32.0	40.5	38.0
0.594	33.0	32.0	...	...
0.625	33.0	32.0	40.5	38.0
0.656	33.0	32.0	...	...
0.688	33.0	32.0	40.5	38.0
0.750-1.000	32.0	31.0	37.0	35.5
1.063	32.0	31.0	35.5	34.0
1.125-1.500	31.0	30.0	35.5	34.0
1.563	31.0	30.0	...	...
1.625	30.0	29.0	34.5	33.0
1.688-2.000	30.0	29.0	...	...
2.125-2.500	29.5	28.5	...	...
2.625-3.375	28.5	27.5	...	...

LEAD

(Prices to jobbers, fob Cleveland, Pittsburgh)

Sheets: Full rolls, 140 sq ft or more, $20.85 per cwt.; add 50c per cwt., 10 sq ft to 140 sq ft; $1.25, less than 10 sq ft; $1, circles and segments. Pipe: Full coils, $20.10 per cwt; cut coils, $20.35. Traps and Bends: List price plus 52%.

ZINC

Sheets, 16.50c-17.00c, fob mill, 36,000 lb and over. Ribbon zinc in coils, 15.25c-16.00c, fob mill, 36,000 lb and over. Plates, not over 12-in., 14.25c; over 12-in., 15.25c.

NICKEL

(Base prices, fob mill.)

Sheets, cold-rolled, 54.00c. Strip, cold-rolled 60.00c. Rods, hot-rolled 50.00c, cold-finished 55.00c. Angles, hot-rolled, 50.00c. Plates, 52.00c. Seamless tubes, 83.00c.

MONEL

(Base prices, fob mill.)

Sheets, cold-rolled 43.00c; No. 35, 41.00c. Strip, cold-rolled, 44.00c. Rods, hot-rolled 39.00c; cold-finished 44.00c. Angles, hot-rolled, 39.00c. Plates, 41.00c. Seamless tubes, 71.00c. Shot and blocks, 31.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb. 52.00-56.00c; 25 to 99 lb, 42.00-46.00c; 100 lb to 4000 lb. 35.00-36.00c.

Plating Materials

Chromic Acid: 99.9%, flake, fob Philadelphia, carloads, 22.00c; 5 tons and over 22.50c; 1 to 5 tons, 23.00c; less than 1 ton, 23.50c.

Copper Anodes: Base, 2000 to 5000 lb; fob shipping point, freight allowed: Flat untrimmed, 30.59c; oval, 30.09c; electrodeposited, 29.84c; cast, 29.59c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 44.00c, fob Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 15.00c; 1000 to 19,900 lb, 14.00c fob Niagara Falls, N. Y.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 25.00c; over 250 lb, 24.00c, fob Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 48.00c; 10,000 to 30,000 lb, 49.00c; 3000 to 10,000 lb, 50.00c; 500 to 3000 lb, 51.00c; 100 to 500 lb, 53.00c; under 100 lb, 56.00c; fob Cleveland. Add 1 cent for rolled depolarized.

Nickel Chloride: 100-lb kegs, 23.50c; 275-lb, or 500-lb bbls. 21.50c, fob Cleveland.

Tin Anodes: Bar, 1000 lb and over 110.00c; 500 to 999 lb, 110.50c; 200 to 499 lb, 111.00c; less than 200 lb, 112.50c; ball, 1000 lb and over, 112.25c; 500 to 999 lb 112.75c; 200 to 499 lb, 113.25c; less than 200 lb, 114.75c, fob Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers and resellers, 67.4c; 100 or 300 lb drums only, 100 to 500 lb, to consumers 59.2c, to resellers 54.8c; 600 to 1900 lb, to consumers 56.8c, to resellers 52.5c; 2000 to 9900 lb, to consumers 55.0c, to resellers 50.9c; 10,000 lb or more l.c.l., to consumers 53.9c, to resellers 49.9c; carloads, to consumers 52.7c, to resellers 48.7c. Prices fob Sewaren, N. J.

Zinc Cyanide: 100-lb drums 37.25c, fob Cleveland; 37.00c, Detroit; 36.00c, fob Philadelphia.

Stannous Sulphate: Less than 2000 lb, in 100 lb kegs, 96.50c, in 400 lb bbl. 95.50c; more than 2000 lb, in 100 lb kegs, 95.50c, in 400 lb bbl, 94.50c.

Scrap Metals

BRASS MILL ALLOWANCES

(Based on 21.50c, Conn., for copper)

Prices in cents per pound for less than 15,000 lb fob shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	19.125	19.125	18.375
Yellow brass	15.625	15.375	14.750
Commercial Bronze			
95%	18.125	17.875	17.375
90%	17.625	17.375	16.875
Red brass			
85%	17.500	17.250	16.750
80%	17.250	17.000	16.500
Best Quality (71-79%)	16.625	16.375	15.875
Muntz Metal	14.750	14.500	14.000
Nickel silver, 5%	16.500	16.250	8.250
Phos. bronze, A. B.	20.750	20.500	19.500
Naval brass	15.250	15.000	14.500
Manganese bronze	15.250	15.000	14.375

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, fob shipping point, carload lots)

No. 1 copper 18.50, No. 2 copper 17.50, light copper 16.50, composition red brass 15.00-15.25, auto radiators 12.50-12.75, heavy yellow brass 10.75-11.00, brass pipe, 11.75-12.00.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 18.50-18.75, No. 2 copper 17.50-17.75, light copper, 16.50-16.75, refinery brass (60% copper), per dry copper content 16.75.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots or more)

Copper and Brass: Heavy copper and wire No. 1 16.75-17.00, No. 2 15.75-16.00, light copper 14.75-15.00, No. 1 composition red brass 13.00-13.25, No. 1 composition turnings 12.50-12.75, mixed brass turnings 7.50-7.75, new brass clippings 13.00-13.50, No. 1 brass rod turnings 10.00-10.50, light brass 7.00, heavy yellow brass 9.25-9.50, new brass rod ends 10.50-11.00, auto radiators, unsweated 10.25-10.50, cocks and faucets 10.25-10.50, brass pipe 10.25-10.50.

Lead: Heavy 15.50-16.00, battery plates 9.75-10.25, linotype and stereotype 17.25-17.50, electrotype 15.00-15.50, mixed babbitt 14.25-14.75, solder joints, 18.75-19.50.

Zinc: Old zinc 5.50-6.00, new die cast scrap 4.75-5.50, old die cast scrap 2.75-3.25.

Tin: No. 1 pewter 64.00-67.00, block tin pipe 82.00-84.00, auto babbitt 50.00-53.00, No. 1 babbitt 51.00-54.00, siphon tops 50.00-52.00.

Aluminum: Clippings 2S 10.50-11.00, old sheets 8.50-9.00, crankcases 8.50-9.00, borings and turnings 4.00-4.50, pistons, free of struts, 8.50-9.00.

DAILY PRICE RECORD

	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
May Avg.	21.500	17.325	12.000	94.000	15.000	33.700	33.750	74.625
June 1-24	21.500	17.30-17.35	12.000	103.000	15.000	35.00	33.750	74.625

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, fob Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery, unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

No. 1 Heavy Melt. Steel	$40.00-40.50*
No. 2 Heavy Melt. Steel	40.00-40.50*
No. 1 Busheling	40.00-40.50*
Nos. 1, 2 & 3 Bundles	40.00-40.50*
Machine Shop Turnings	36.50-37.00
Mixed Borings, Turnings	36.50-37.00
Short Shovel Turnings	37.00-37.50
Cast Iron Borings	36.50-37.00
Bar Crops and Plate	47.50-48.00
Low Phos. Steel	47.50-48.50
Heavy Turnings	39.50-40.00

Cast Iron Grades

No. 1 Cupola	63.00-65.00
Charging Box Cast	53.00-54.00
Heavy Breakable Cast	56.00-58.00
Unstripped Motor Blocks	52.00-53.00
Malleable	69.00-70.00
Brake Shoe	52.00-53.00
Clean Auto Cast	58.00-59.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	41.00-41.50
R.R. Malleable	75.00-80.00
Axles	51.50-52.00
Rails, Rerolling	56.00-58.00
Rails, Random Lengths	54.00-56.00
Rails, 3 ft and under	61.50-62.00
Rails, 18 in. and under	62.50-63.50
Railroad Specialties	55.00-56.00
Uncut Tires	52.00-52.50
Angles, Splice Bars	53.00-54.00

* Plus applicable freight springboard.

CLEVELAND

No. 1 Heavy Melt. Steel	$39.50-40.00*
No. 2 Heavy Melt. Steel	39.50-40.00*
No. 1 Busheling	39.50-40.00*
Nos. 1 & 2 Bundles	39.50-40.00*
Machine Shop Turnings	34.50-35.00
Mixed Borings, Turnings	34.00-36.00
Short Shovel Turnings	35.50-36.00
Cast Iron Borings	35.50-36.00
Bar Crops and Plate	44.50-45.00
Punchings & Plate Scrap	44.50-45.00
Heavy Turnings	39.50-40.50
Alloy Free Turnings	37.50-38.50
Cut Structurals	46.00-49.00

Cast Iron Grades

No. 1 Cupola	67.00-69.00
Charging Box Cast	58.00-60.00
Stove Plate	58.00-60.00
Heavy Breakable Cast	54.00-56.00
Unstripped Motor Blocks	58.00-60.00
Malleable	73.00-75.00
Brake Shoes	52.00-53.00
Clean Auto Cast	68.00-70.00
No. 1 Wheels	58.00-60.00
Burnt Cast	56.00-57.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.50-41.50*
R.R. Malleable	73.00-78.00
Rails, Rerolling	57.00-58.00
Rails, Random Lengths	56.00-57.00
Rails, 3 ft and under	61.00-63.00
Cast Steel	56.00-58.00
Railroad Specialties	53.00-55.00
Uncut Tires	51.00-53.00
Angles, Splice Bars	57.00-59.00

* Plus applicable freight springboard.

VALLEY

No. 1 Heavy Melt. Steel	$40.00-40.50*
No. 2 Heavy Melt. Steel	40.00-40.50*
No. 1 Bundles	40.00-40.50*
Machine Shop Turnings	34.50-35.50
Short Shovel Turnings	36.50-37.00
Cast Iron Borings	36.00-36.50
Low Phos.	46.00-47.50*

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.50-41.50*

* Plus applicable freight springboard.

MANSFIELD

Machine Shop Turnings	$35.00-35.50
Short Shovel Turnings	37.00-37.50

CINCINNATI

No. 1 Heavy Melt. Steel	$39.50
No. 2 Heavy Melt. Steel	39.50
No. 1 Busheling	39.50
Nos. 1 & 2 Bundles	39.50
Machine Shop Turnings	33.50
Mixed Borings, Turnings	32.50
Short Shovel Turnings	35.50
Cast Iron Borings	34.50

Cast Iron Grades

No. 1 Cupola Cast	55.00
Charging Box Cast	43.00
Heavy Breakable Cast	50.00
Stove Plate	47.00
Unstripped Motor Blocks	45.00
Brake Shoes	45.00
Clean Auto Cast	55.00
Drop Broken Cast	60.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.50
R.R. Malleable	68.00
Rails, Rerolling	53.00
Rails, Random Lengths	50.00
Rails, 18 in. and under	60.00

DETROIT

(Brokers' buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$35.00-35.50
No. 1 Busheling	35.00-35.50
Nos. 1 & 2 Bundles	35.00-35.50
No. 3 Bundles	35.00-35.50
Machine Shop Turnings	29.00-29.50
Mixed Borings, Turnings	29.00-29.50
Short Shovel Turnings	30.00-30.50
Cast Iron Borings	30.00-30.50
Punchings & Plate Scrap	40.00-40.50

Cast Iron Grades

No. 1 Cupola Cast	53.00-58.00
Heavy Breakable Cast	47.00-52.00
Clean Auto Cast	53.00-58.00

BUFFALO

No. 1 Heavy Melt. Steel	$43.00-45.00
No. 2 Heavy Melt. Steel	39.75-40.25
No. 1 Busheling	39.75-40.25
No. 1 & 2 Bundles	39.75-40.25
Machine Shop Turnings	34.75-35.25
Mixed Borings, Turnings	34.75-35.25
Cast Iron Borings	35.50-36.00
Short Shovel Turnings	35.50-36.00
Low Phos.	44.75-45.25

Cast Iron Grades

No. 1 Cupola	64.00-65.00
Mixed Cupola	60.00-62.00
Heavy Breakable Cast	55.00-57.00
Malleable	70.00-75.00
Clean Auto Cast	62.00-64.00

Railroad Scrap

Rails, 3 ft. and under	60.00-61.00
Railroad Specialties	51.00-53.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$42.00-43.00
No. 2 Heavy Melt. Steel	39.00
No. 1 Busheling	39.00
Nos. 1 & 2 Bundles	39.00
No. 3 Bundles	37.00
Machine Shop Turnings	34.00-35.00
Mixed Borings, Turnings	34.00-35.00
Short Shovel Turnings	34.00-35.00
Bar Crop and Plate	47.50-48.00
Punchings & Plate Scrap	48.00-48.50
Cut Structurals	47.50-48.00
Elec. Furnace Bundles	44.00-44.50
Heavy Turnings	43.00-43.50
No. 1 Chemical Borings	42.00-43.00

Cast Iron Grades

No. 1 Cupola Cast	63.00-65.00
No. 1 Machinery Cast	66.00-67.00
Charging Box Cast	62.50-63.50
Heavy Breakable Cast	62.50-63.50
Unstripped Motor Blocks	59.50
Malleable	76.00-78.00
Clean Auto Cast	64.00
No. 1 Wheels	68.00-70.00

NEW YORK

(Brokers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$34.50
No. 2 Heavy Melt. Steel	34.50
No. 1 Busheling	34.50
Nos. 1 & 2 Bundles	34.50
No. 3 Bundles	32.50
Machine Shop Turnings	28.50-29.00
Mixed Borings, Turnings	28.50-29.00
Short Shovel Turnings	30.50-31.00
Punchings & Plate Scrap	40.00-41.00
Cut Structurals	40.00-41.00
Elec. Furnace Bundles	40.00-41.00

Cast Iron Grades

No. 1 Cupola Cast	55.00-57.00
Charging Box Cast	56.00-58.00
Heavy Breakable	56.00-58.00
Unstripped Motor Blocks	52.50-53.50
Malleable	68.00-69.00

BOSTON

(Fob shipping point)

No. 1 Heavy Melt. Steel	$31.90
No. 2 Heavy Melt. Steel	31.90
No. 1 Bundles	31.90
No. 1 Busheling	31.90
Machine Shop Turnings	26.90
Mixed Borings, Turnings	26.90
Short Shovel Turnings	28.90
Bar Crops and Plate	35.00-37.00
Punchings & Plate Scrap	35.00-37.00
Chemical Borings	37.00-37.50

Cast Iron Grades

No. 1 Cupola Cast	50.00-52.00
Heavy Breakable Cast	53.00
Stove Plate	50.00
Unstripped Motor Blocks	48.00
Clean Auto Cast	50.00-52.00

CHICAGO

No. 1 Heavy Melt. Steel	$39.00-39.50
No. 2 Heavy Melt. Steel	39.00-39.50
No. 1 Bundles	39.00-39.50
No. 2 Bundles	39.00-39.50
No. 3 Bundles	37.00-37.50
Machine Shop Turnings	34.00-34.50
Mixed Borings, Turnings	34.00-34.50
Short Shovel Turnings	36.00-36.50
Cast Iron Borings	35.50-36.00
Bar Crops and Plate	46.50-47.00
Punchings	48.00-48.50
Elec. Furnace Bundles	40.00-40.50
Heavy Turnings	38.50-39.00
Cut Structurals	44.00-44.50

Cast Iron Grades

No. 1 Cupola Cast	67.00-70.00
Clean Auto Cast	67.00-70.00
No. 1 Wheels	61.00-62.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	41.25-44.25
Malleable	75.00-76.00
Rails, Rerolling	54.00-55.00
Rails, Random Lengths	51.00-52.00
Rails, 3 ft and under	56.00-57.00
Rails, 18 in. and under	58.00-59.00
Railroad Specialties	52.00-53.00
Angles, Splice Bars	53.00-54.00

ST. LOUIS

No. 1 Heavy Melt. Steel	$40.50-41.00
No. 2 Heavy Melt. Steel	37.50-38.00
Machine Shop Turnings	32.50-33.50
Short Shovel Turnings	34.50-35.50

Cast Iron Grades (Fob shipping point)

No. 1 Cupola Cast	65.00-67.00
Mixed Cast	59.00-60.00
Heavy Breakable Cast	55.00-56.00
Brake Shoes	57.00-58.00
Clean Auto Cast	65.00-67.00
Burnt Cast	59.00-60.00

Railroad Scrap

R.R. Malleable	65.00-70.00
Rails, Rerolling	50.50-52.50
Rails, Random Lengths	50.00-51.00
Rails, 3 ft and under	56.00-58.00
Uncut Tires	48.00-49.00
Angles, Splice Bars	55.00-56.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$37.50
No. 2 Heavy Melt. Steel	37.50
No. 1 Busheling	37.50
Nos. 1 & 2 Bundles	37.00
No. 3 Bundles	35.00
Long Turnings	24.50
Short Shovel Turnings	26.00-27.00
Cast Iron Borings	25.00
Bar Crops and Plate	40.00
Cut Structurals	38.50

Cast Iron Grades

No. 1 Cupola Cast	63.00
Stove Plate	60.00-62.00
No. 1 Wheels	59.00-61.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	38.00
R.R. Malleable	nom.
Axles, Steel	50.00
Rails, Rerolling	53.00-55.00
Rails, Random Lengths	45.00-48.00
Rails, 3 ft and under	53.00-55.00
Angles and Splice Bars	52.00-53.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	*$25.00
No. 2 Heavy Melt. Steel	*25.00
No. 1 Busheling	*25.00
Nos. 1 & 2 Bundles	*25.00
No. 3 Bundles	*19.00
Machine Shop Turnings	*15.50
Bar Crops and Plate	25.00
Cast Steel	25.00
Alloy Free Turnings	15.50
Cut Structurals	25.00
Tin Can Bundles	19.00

Railroad Scrap

No. 1 Heavy Melting	26.00
Axles	32.00
Rails, Random Lengths	26.50
Uncut Tires	33.50

* Fob California shipping point.

SEATTLE

No. 1 Heavy Melt. Steel	$26.00
No. 2 Heavy Melt. Steel	26.00
No. 1 Busheling	26.00
Nos. 1 & 2 Bundles	22.00-23.00
No. 3 Bundles	22.00-23.00
Machine Shop Turnings	19.00-21.00
Mixed Borings, Turnings	19.00-21.00
Punchings & Plate Scrap	26.00-28.00
Cut Structurals	26.00-28.00

Cast Iron Grades

No. 1 Cupola Cast	40.00
Charging Box Cast	25.00
Heavy Breakable Cast	24.00
Stove Plate	25.50
Unstripped Motor Blocks	24.00
Malleable	30.00
Brake Shoes	30.00
Clean Auto Cast	30.00
No. 1 Wheels	26.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	22.00
Railroad Malleable	30.00
Rails, Random Lengths	21.50
Angles and Splice Bars	23.00

LOS ANGELES

No. 1 Heavy Melt. Steel	$25.00
No. 2 Heavy Melt. Steel	25.00
Nos. 1 & 2 Bundles	25.00
Machine Shop Turnings	16.00
Mixed Borings, Turnings	15.50-16.00
Punchings & Plate Scrap	28.00
Elec. Furnace Bundles	28.00

Cast Iron Grades

No. 1 Cupola Cast	35.00-36.00

HAMILTON, ONT.

(Ceiling prices, delivered)

Heavy Melt.	$22.00
No. 1 Bundles	22.00
Mechanical Bundles	20.00
Mixed Steel Scrap	19.00
Mixed Borings, Turnings	17.00
Rails, Remelting	28.00
Rails, Rerolling	26.00
Bushelings	17.00
Bushelings, new factory, prep'd	21.00
Bushelings, new factory, unprep'd	16.00
Short Steel Turnings	17.00

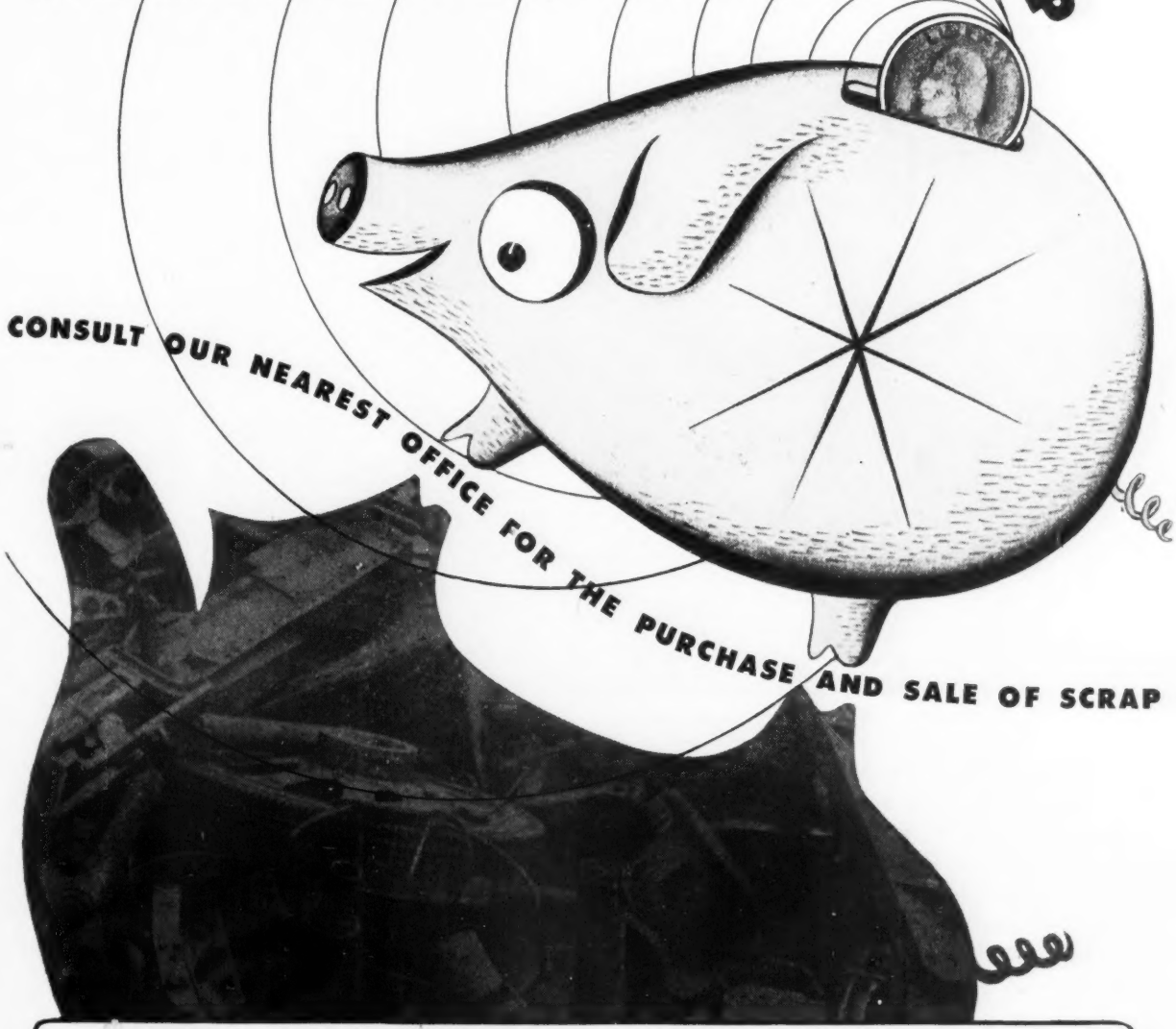
Cast Iron Grades*

No. 1 Cast	42.00-48.00
No. 2 Cast	35.00-37.00

* Removed from price control Aug. 9, 1947; quoted on basis of fob shipping point.

FILL 'ER UP

Every ton of iron and steel scrap is badly needed. The national reservoir of scrap was drained of 4,000,000 tons during the war and it has not had the time to fill up again. Meanwhile, steel mills and foundries, seeking to operate at high rates of production, have a problem of inadequate supply of scrap.



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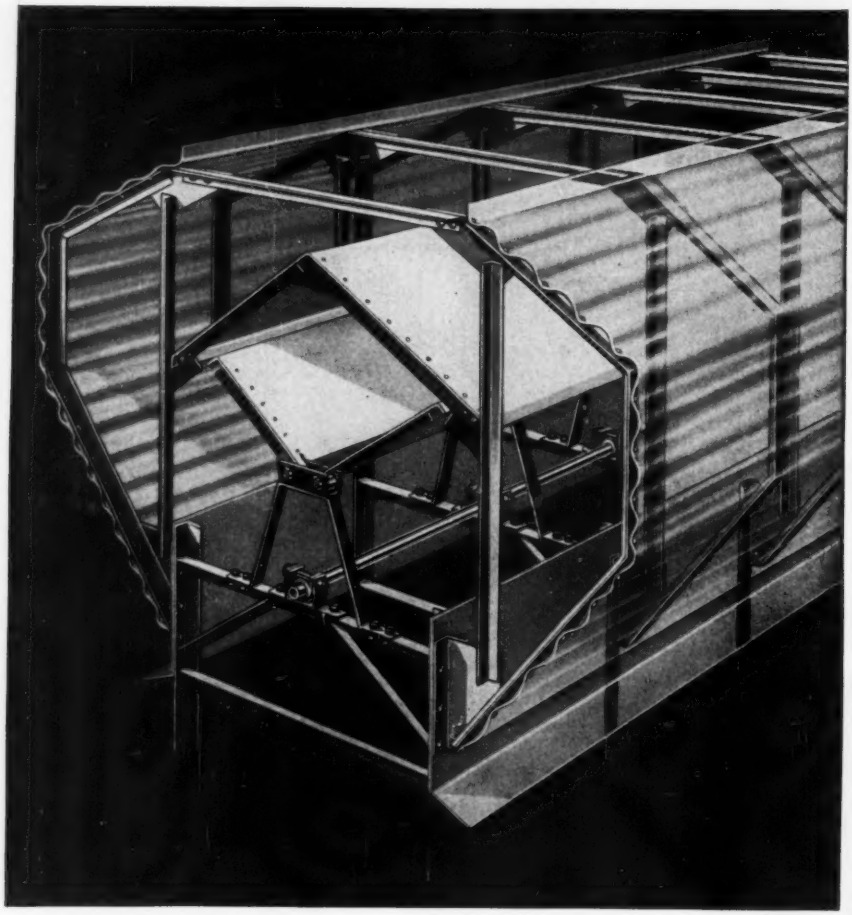
LEADERS IN IRON AND STEEL SCRAP SINCE 1889

BEAT SUMMER SLUMP WITH BURT VENTILATORS



Insufficient ventilation may be responsible for a good share of your hot weather troubles. Often, a sharp drop in production and a rise in rejects, minor accidents and absenteeism may be traced directly to improper plant ventilation. The remedy is simple—a properly engineered and installed Burt Ventilating System. Burt engineers will help you with layouts and specifications. From the complete Burt line of gravity, fan and continuous ridge ventilators, they can recommend the sizes and types that will perform best for you. Special Units, if required, can be produced in Burt's highly efficient fabricating plant quickly and economically. Half a century of ventilating experience assures you a properly engineered and efficient ventilating system when Burt does the job. See Sweet's or write for catalog and data sheets on the Burt line—NOW.

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Sheets, Strip . . .

Higher prices before the year-end appear inevitable as costs move upward

Sheet Prices, Page 122

Boston—Steel consumers are bracing themselves for higher prices before the year end, opinion growing that the industry can not hold the line against increased costs. Pointing to advance in prices in other major industries, notably the automobile and electrical, doubt is expressed steel will be able to hold out against the contrary trend. Agreement is general that any increase in coal mining or coke costs will crack current price structures.

Demand for flat-rolled is at peak level with third quarter allocations adversely affected by production losses, carryovers and lower quotas, especially in hot-rolled carbon sheets. Flat-rolled specified for the warm air heating program must be certified by producers and not passed on through warehouses. Users of long ternes are confronted with the problem of new sources of supply after September when one leading producer in the East halts output of that product. Short ternes or galvanized are likely to be substituted in some instances. Demand is heavy for enameling and electrical sheets with substitution of cold rolled for the former frequent.

Considerable stainless is sold with 100-grit finish moving at the 2B finish price. Demand for stainless is brisk with deliveries ranging from eight to 10 weeks. One of the most acute problems in the narrow strip situation is the limited tonnage of hot strip available for cold reduction in the lower carbon grades.

Pittsburgh—No easing in pressure for sheet and strip deliveries is in evidence. Reported accumlation of household appliances in dealers' hands has not yet been reflected in hold-up of deliveries or order cancellations from metalworking plants. About 21,000 tons of sheets and other steel products have been tentatively added to the warm air furnace program for delivery during the period of July 1 to Feb. 28, 1949. The industry also has tentatively committed itself to supply 58,000 tons for prefabricated steel house construction; and an additional 16,000 tons for third-quarter export delivery to Greece and Iceland. Mills are hopeful of clearing up carry-over tonnage during July by limiting new order acceptance during this period. Production schedules of the various sheet products, notably enameling and electrical stock, continue to fall substantially below demand. Moderate upturn in new orders for stainless sheets and strip are reported by some producers.

Philadelphia — Sheet consumers report supply as being increasingly stringent, with no relief in sight. The situation is complicated by the further withdrawal of various midwestern mills from the seaboard market.

One independent has advanced prices on hot-rolled sheets at a western Pennsylvania unit $25 a ton. This brings the per pound price at this plant up to 4.05c Pittsburgh base, actually higher than the cold rolled

Available in Grades to suit your needs

Allegheny Ludlum High Speed Drill Rod in these specially-processed smaller sizes is available to you in all types of High Speed Steels, as well as high carbon-high chrome Die Steel types. You can get the *grade* you're used to, plus better results—why not investigate its possibilities?

ADDRESS DEPT. S-65

Do you use High Speed Drill Rod in the smaller sizes? If so, here's an Allegheny Ludlum development that you can translate into real advantages —longer tool life, better performance, greater production.

A-L now *hot-draws* these small sizes by a special process, instead of cold-drawing with its repeated passes and anneals—each of which takes something out of the steel. The result is: a high degree of hardness, obtained with fine grain size, and with small, evenly distributed carbides for keen cutting edges; plus maximum toughness in the hardened and tempered condition.

By actual test, ⅛" *hot drawn* High Speed Drill Rod at 64 Rockwell C is as much as 18% *tougher* than cold drawn at the same hardness. ● But the best test is to *try* this Drill Rod—*prove* its merits for yourself. Check with your local Allegheny Ludlum Branch Office or distributor.

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STEEL CORPORATION
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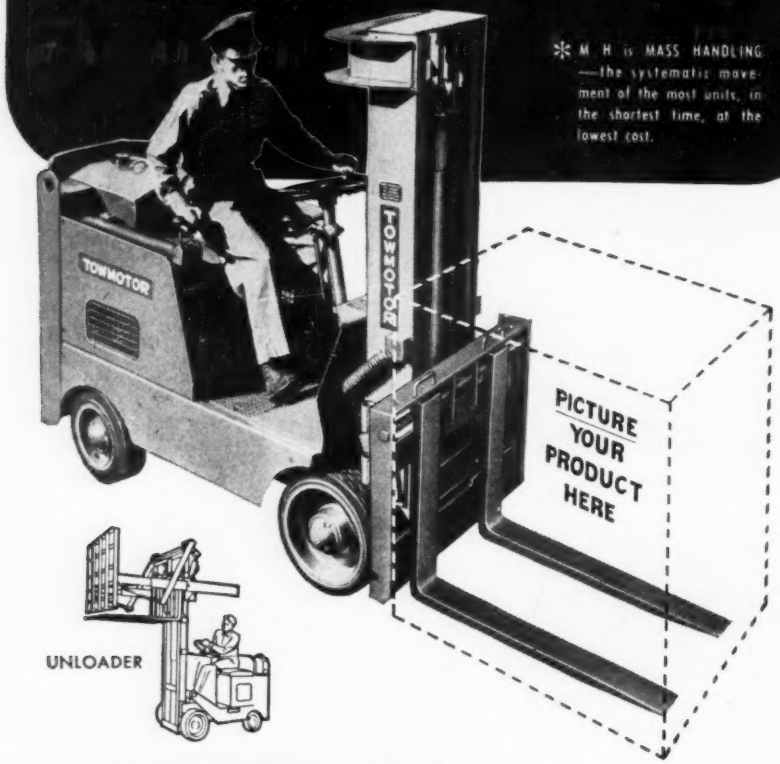

* M H is MASS HANDLING —the systematic movement of the most units, in the shortest time, at the lowest cost.

Double and triple savings with standard Towmotor Accessories. However, if a standard Towmotor unit does not solve your handling problem, Towmotor engineers welcome the opportunity to design special equipment to meet your specific needs. Details are available without obligation.

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market. A relatively small tonnage is available and is being offered only as a special service to certain customers. The company will not produce hot-rolled sheets at this plant after the needs are filled. The producer had been taking a sharp loss on such tonnage as had been offered.

Cincinnati — District sheet mills are pressing for peak output in an effort to ship all tonnage scheduled for the second quarter as quickly as possible, yet the carryover is so large, due to mine strike and flood shutdowns, that the goal likely will not be attained until August. Reduced quotas for third quarter are a factor in eliminating all cancellations. Plans for vacations, which are more general than usual, in fabricating shops, are having no effect on demand.

Birmingham — Not the slightest easing in sheets is noted in the district, although some flat rolled products are having at least a momentary breathing spell. All of which, however, probably means nothing in view of the overall picture, according to steel consuming sources. Cotton tie and barrel hoop production is accounting for a relatively large production of strip.

Plates . . .

Plate Prices, Page 123

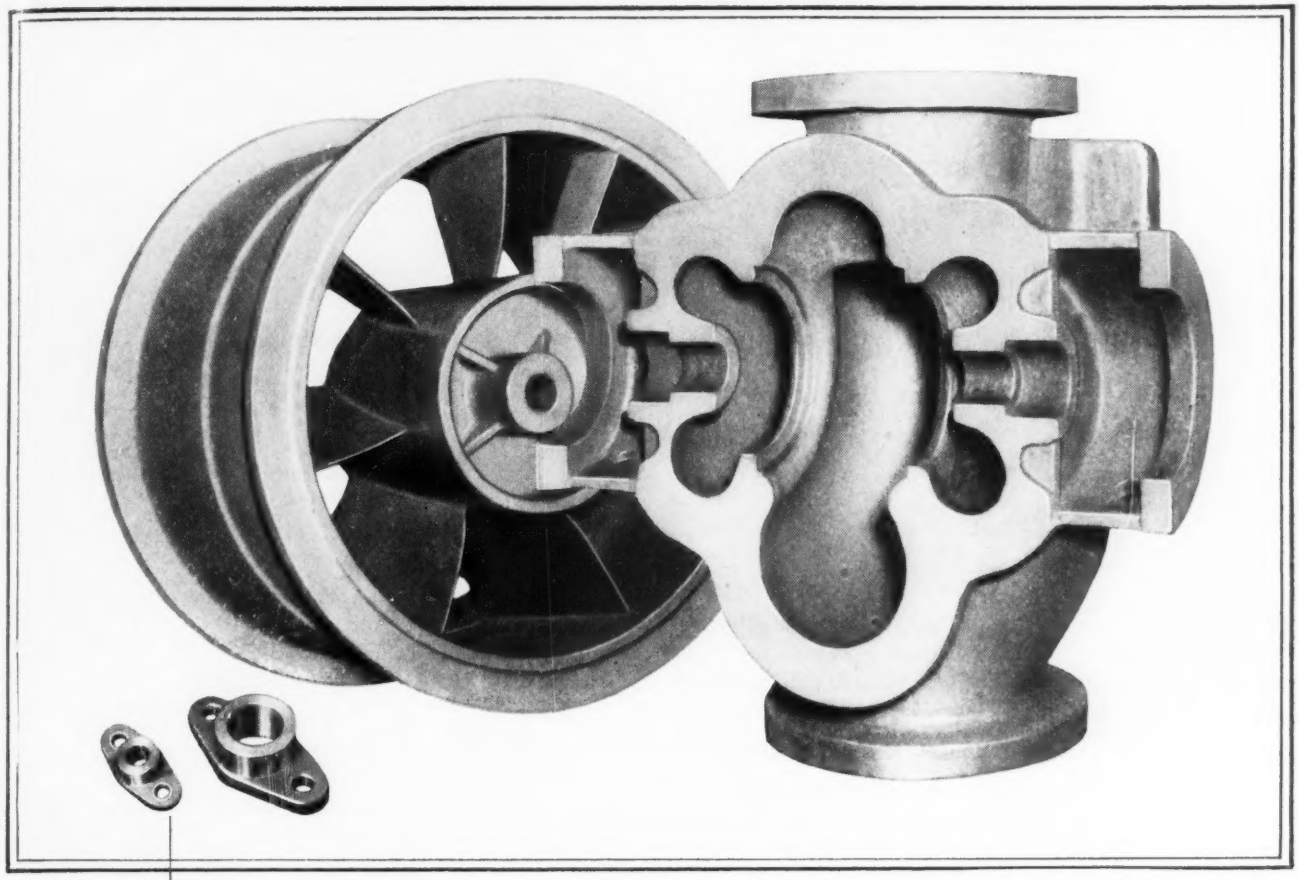
New York — Plate sellers want a clearer outline of defense needs before becoming too concerned about immediate effects of mandatory controls, as provided in the recent draft law. They are disposed at the moment to believe that the controls will have little early effect, although they admit they will not know where they stand until something more definite is forthcoming. Meanwhile, they are far oversold in many instances, with arrearages at the end of this quarter likely to average around a month's production. Third quarter quotas have been established and, in the opinion of at least some producers, these quotas will not likely be disrupted too greatly by defense allocations.

Boston—Selective selling is prevalent in plate distribution and is becoming more so. Two mills taking light carbon plate tonnage are now overloaded. Several independent producers claim they can not afford to roll light carbon plates, 3/16 and one-quarter inch, and are concentrating therefore, largely on fire box, flange steel and other grades on which the margin gives a profit. Small tank builders and fabricators of light plate parts are more pinched for steel. Volume is steadily narrowing for general distribution against allocations as more plate tonnage is set aside for specific requirements.

A wide range of prices prevails in plates and consumers are paying more now than before the reductions announced last month. In practice, there has been no reduction and because of higher freight the cost of the delivered product is up.

Demand for smaller heads is somewhat effected by the limited volume of heavy sheets and light plates for shells.

Birmingham — Plate output continues to lag considerably behind demand. Freight car requirements are being substantially met, but pressure due to withdrawal of regular sheet



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Seldom are two structural casting problems precisely the same. A pump housing, for instance, presents certain requirements, while an impeller may call for a completely different alloy and casting technique.

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The unique engineering service of National Bearing Division includes a complete study of the important factors involved in each casting application. The unvarying result of this N-B-M service is to find the answers to such problems as:

The Proper Alloy—for long, trouble-free service and increased resistance to corrosion.

The Proper Casting Design—for a high factor of strength to handle safely the projected loads, pressures and stresses.

The Proper Casting Technique—for close tolerances consistent with maximum economy and ease of finished machining operations.

Any successful application of a structural part—large or small — depends on the correct solution to these basic problems of design. Let the specialized approach and broad experience of National Bearing Division find the right answers for you.

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NATIONAL BEARING DIVISION

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~it's from HERE

to HERE

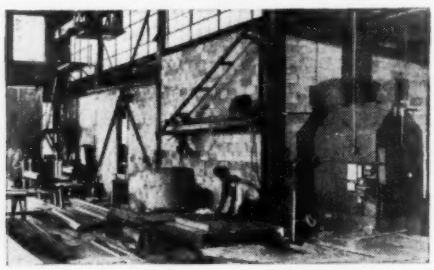
● It's an easy matter to define the "comfort zone" in a plant. It's that eight or ten feet above the floor that must be heated for employee comfort. But it's quite another matter to heat it economically and effectively when thirty feet of air space extend above it to the roof.

Such a problem faced the Minweld Steel Company in its new fabricating plant in Pittsburgh—and a Dravo *Counterflo* Heater solved it for them.

This powerful unit discharges warm air above the heads of the workers, circulates it through the working area, and returns it without drafts to the base of the heater for reheating and recirculating. This method maintains uniform heat throughout the 6,500 square foot working area—even though two 19-foot square truck doors open at each end, and metal-siding walls are broken by an abundance of windows.

Installation of the self-contained Dravo *Counterflo* Heater required only a fuel line, a power line and a small venting stack—no boiler room or piping. Ductwork, too, is unnecessary because capacity is ample to blanket a radius of 250 feet completely and *evenly* with warm air. The unit is entirely automatic . . . it is shut off at night—and at 6 A.M. the watchman simply flips a switch and the plant is warm fifteen minutes later.

Bulletin IT-516 contains valuable information about the Dravo *Counterflo* Heater which you can apply to your own heating problems. Write for it, Heating Section, Dravo Corporation, Dravo Building, Pittsburgh 22, Pa.



In a fabricating plant such as Minweld Steel Company, man-hours and efficiency are vitally important. "In a recent two week period," Owner William Minnotte says, "we estimated a saving of twenty man-hours because our men didn't have to stop work and try to get warm around old-fashioned coal stoves. Increased productivity, of course, is also tied to the increased comfort of our employees."

Dravo also manufactures the *DRAVO CRANE CAB COOLER* for air conditioning hot-metal crane cabs

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allocations from a Gadsden mill is being anticipated with considerable misgiving by local fabricators. Inquiries for more or less speculative needs are substantial but receive slight encouragement.

Seattle—Plates are increasingly critical and fabricating plants are confining operations to materials available. Allocations are disappointingly low. Management reports a good volume of small jobs, but large projects are not sought.

Tubular Goods . . .

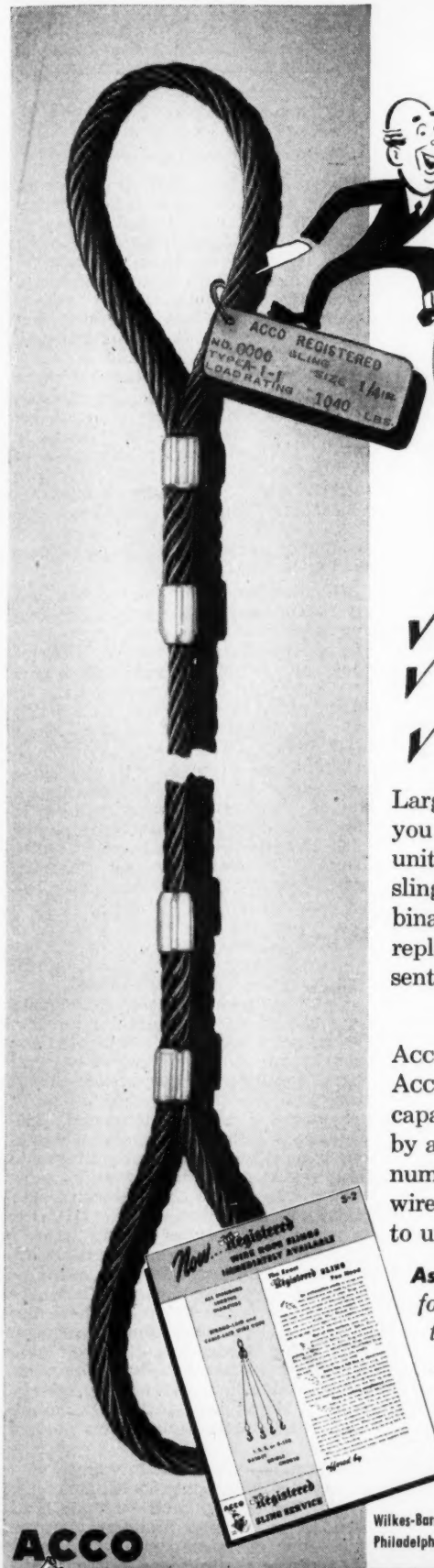
Tubular Goods Prices, Page 123

Boston — Most steel pipe mills are behind on delivery schedules and are booking orders over the balance of this year more in line with ability to ship tonnage entered. At least one month is being blanked in third quarter by some producers. Several are adjusting their booking policies in attempts to eliminate or reduce carryovers. Utilities are especially hard pressed for pipe with a heavy tonnage unplaced. One builder of unit heaters is using pressure tubing for heating elements and several users of tubing are considering installation of tube forming mills, although concerned as to availability of strip steel. Contractors with heating and plumbing contracts, unable to anticipate needs, depend on stock lots at higher than normal costs; car lots are frequently involved and mill shipments against this type of volume are slim. Open hearth butt weld pipe is finding new applications and steel pipe of that grade is going into snow-melting systems as well as wrought iron. Last winter's weather gave this application a lift. Heavier demand for pipe shipbuilding looms late this year.

The shortage of steel pipe is emphasized by the fact not one bid was received on 38,000 feet, 1¼ to 2-inch, required by New York city. Of this tonnage, 28,940 feet is 2-inch; the inquiry is being readvertised.

Pittsburgh — Demand continues to far exceed supply of seamless and electric weld hot and cold-drawn boiler tubing. Pressure tubing supply particularly is very tight. There is no particular emphasis in demand between the carbon and alloy tubing grades, although deliveries on stainless items are less extended than on others. Sellers of large diameter line pipe are booked into 1951. Unprecedented demand for plates is said to have forced one large producer to at least temporarily shelve plans for entry into pipe fabrication field. Acute shortage of pipe is further reflected in recent announcement of U. S. government to put off until September a decision on whether to let 68,000 tons of pipe go to Saudi, Arabia, for construction of a 1100-mile pipe line from oil fields there to the Mediterranean. Pipe for only about 250 miles of the 1100-mile pipe line has been licensed for export so far.

Seattle—Seattle opened bids June 18 for 870 tons, bell and spigot, for local improvements. Award is pending. An unstated tonnage of 10-inch steel pipe is involved at the Monroe state reformatory, general contract going to Blake-Thompson Construction Co., Mt. Vernon at $69,888, including a steel reservoir. The cast



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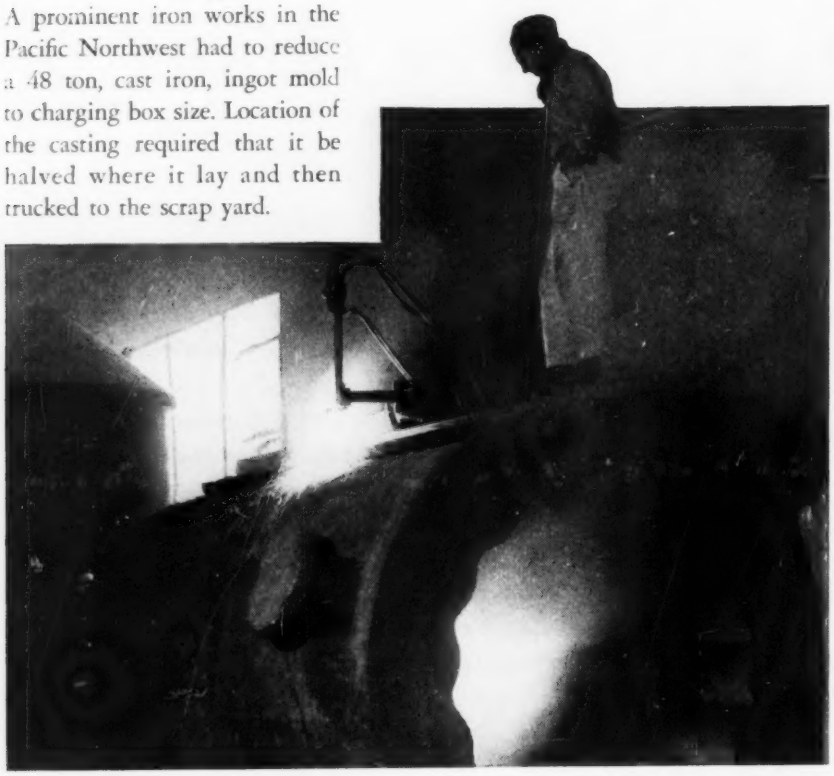
48 ton, 15 inch thick ingot mold cut in 96 minutes

A prominent iron works in the Pacific Northwest had to reduce a 48 ton, cast iron, ingot mold to charging box size. Location of the casting required that it be halved where it lay and then trucked to the scrap yard.



L. R. Hayward, Airco Technical Sales Representative, suggested cutting with an Airco Radiagraph, equipped with a water cooled torch. A 2½ inch square billet, to be used as a waster, was placed the length of the 12 foot casting and the Radiagraph set for a forward speed of 1½" per minute. Fire clay was packed on both sides of the billet to keep the molten steel in the kerf. The oxyacetylene flame slashed thru the 15" thick casting and the 2½" waster at a speed that required only 96 minutes to make the 12 foot long cut.

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iron market is slow due entirely to the inability of mills to make deliveries within 24 months. The potential demand is extensive in this area.

Steel Bars . . .

Bar Prices, Page 122

Boston—Carbon bar inventories, notably those of hot-rolled, are limited with most consumers. Supply of cold-drawn is tightening along with alloys. Delivery on open-hearth alloy bars is extended to October in more cases. Balance between bar supply and requirements has fluctuated, but currently is wider than was the case some months back. Demand is heavy, especially for flats, and there is more substituting in grades and sizes. Forge shop needs are substantial, accounting in part for the upturn in alloys. Third quarter allocation of hot carbon bars to cold mills are slightly lower. The railroad program allocations for car building are pegged at the recent high level. For armament, some scattered trial orders are appearing for alloys.

Philadelphia — Hot carbon bar supply continues to fall short of requirements of most consumers, regardless of the specifications involved. Stringency also is noted in cold-drawn carbon bars, with sellers having little to offer before the last quarter of this year and, on certain of the small sizes, little before December.

While one district mill will have arrearages of not more than two weeks' production, plate sellers in general will go into the third quarter with a carryover of at least a month. Demand continues strong from a wide diversity of sources.

Wire . . .

Wire Prices, Page 123

Pittsburgh — No let-up in demand for bulk of merchant and manufacturers' wire products is indicated for months ahead. Distribution of wire items continues under strict allocation and, on the basis of constant pressure for prompt deliveries, production is falling far short of meeting even the essential requirements of many customers. However, some easing in demand for fine wire specialty items, such as tire bead wire, is noted. Supply of spring wire is still very tight, but occasional openings in production schedules occur as result of reduced demand from the bed spring trade. Some sellers also note moderate reduction in requirements for wire rope. Despite near record production schedules for nails, fence and other merchant products, most jobbers' inventories are unbalanced and substantially below desired levels.

Boston — Demand for most wire specialties is unabated with schedules in for September and beyond. High ratio of wire being produced requires extensive processing on which mills are unable to increase current production levels. Due to vacation closings next month, output will be lower. Rarely are wire consumers turning back any part of their allocation and many are pressing for increases. Heading wire continues in strong demand with consumer inventories generally out of balance.

Low carbon material is in short supply, reflecting limitations in rods. Music wire is one of the easier items, partly the result of increased capacity. Lack of rods, however, slows down output of most finished carbon products.

Birmingham — Wire products apparently have settled down for another period of pronounced scarcity. Jobbers, among them the South's largest, report increasing pressure for such items as nails, fencing and baling wire, while spring wire is temporarily in better supply.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 122

Seattle—Reinforcing bar orders in small tonnages are swamping rolling mills in this area which are striving to speed deliveries and reduce backlogs. Northwest Steel Rolling Mills, Seattle, will close July 2 to 19 for annual overhaul and repairs, but the electric furnaces will continue producing an ingot inventory.

Structural Shapes . . .

Structural Shape Prices, Page 123

New York — Structural bookings in May of 131,843 tons were down 18,867 tons from the preceding month, according to American Institute of Steel Construction. However, bookings for the first five months of 786,429 tons were 20 per cent greater than the 654,780 tons reported in the corresponding period of 1947. They also were substantially greater than the 565,437 tons which is the estimated average for the five months in the prewar years of 1936-1940, inclusive. The Institute reports a revised figure for April of 150,710 tons.

Shipments in May totaled 168,522 tons, as compared with a revised total of 162,346 tons for April. Total shipments in the first five months amounted to 785,816 tons, or 8 per cent greater than for the same period in 1947. Tonnage available for fabrication in the next four months is 593,380 tons.

Amendment to the recently enacted draft law placing steel under mandatory control for defense purposes is creating considerable trade speculation as to the effects on nondefense building. Shapes are a low profit item and their production has suffered because of the amount of steel going into the more profitable products. Add to this situation a sharp increase in mandatory defense work of most any description and the diversion of steel from shapes would be still heavier. However, it is still too early for any accurate appraisal as to what may be expected over the next several months as a result of this draft law provision.

Boston — Public work, notably bridges, account for a higher ratio of structural inquiry. Bids are in on 8500 tons for an express highway, East Boston; a three-span bridge, 365 tons, Beverly, Mass., closes June 29. There is a decline in new contracts. Enough small-tonnage inquiry is coming out to about balance allocations to smaller fabricating shops, although July will be a lean month, being blanked out by some units. Deliveries with larger shops range from five to six

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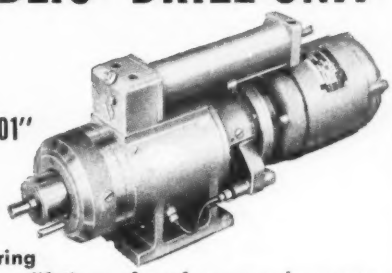

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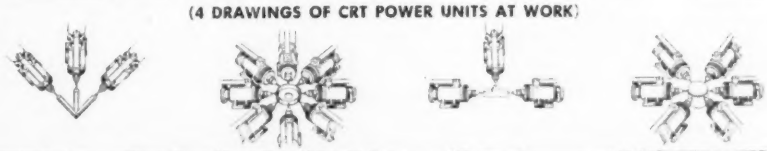
(4 DRAWINGS OF CRT POWER UNITS AT WORK)



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months, about four months being required on shop work. Several small bridge contracts, however, have been recently placed for October completion. Lighter sizes in plain material are especially short, reflecting tightness in tubular products.

Philadelphia — Structural awards have been negligible over the past week, although various projects are pending. Fabricators will have substantial backlogs and complain of difficulty in balancing steel inventories. District fabricating shops recently have advanced wages to the extent of 10½ cents in some instances.

Approximately 6000 tons, principally sheets, are pending for an extension to the Harmon Homes project, Wilmington, Del. This development is comprised of prefabricated units.

Seattle—Fabricating plants are restricted in bidding on new business and in maintaining operations by the increasing shortage of materials. Third quarter mill allocations are reduced and bids are not entered for attractive jobs for this reason. There is a strong demand for shapes, both for public works and private construction. Much tonnage is pending.

Tin Plate . . .

Tin Plate Prices, Page 123

Pittsburgh — Tin plate specifications for third quarter indicate little revision in pattern of requirements except for the slightly greater demand for hot-dipped plate in relation to electrolytic for peak seasonal needs of fruit and vegetable packs. Barring a prolonged coal strike, monthly output of tin plate during the third quarter is expected to be maintained at present high levels. Even should a lengthy coal strike develop, tin plate production schedules likely would be the last to be curtailed, reflecting four to five-week production "lead time" required and the fact that mills normally carry a substantial inventory of coils.

General restriction of steel allotments for the production of tin plate, industrial gas shortages earlier this year and disruption of production schedules due to a strike at one major producer's plant were the major factors restricting tin plate output during the first half this year. If these factors had not been present, output of tin plate the first six months this year would have been substantially in excess of that produced in comparable 1947 period because of the moderate expansion and speed-up of production facilities.

Iron Ore . . .

Iron Ore Prices, Page 124

Cleveland — Shipments of Lake Superior iron ore totaled 2,722,072 tons during the week ended June 21 compared with 2,791,965 tons for the preceding week and 2,638,370 tons for the like 1947 week, according to the Lake Superior Iron Ore Association, this city. This brought the season's total to 27,176,059 tons compared with 22,514,673 tons for the like 1947 period. Shipments from United States ports alone totaled 2,680,068 tons during the week ended June 21, an average daily loading of 382,867 tons compared with 392,944 tons for the previous week, making the season's total 26,859,530 tons, an increase of 4,936,975 tons over the total for the like 1947 period.

Warehouse . . .

Warehouse Prices, Page 125

Pittsburgh—Steel distributors' inventories of hot and cold-rolled sheets, plates and shapes have recorded little improvement in recent weeks despite strict allocation of supplies. Supply outlook for third quarter is not encouraging for mills have limited bookings in effort to reduce carry-over tonnage. Some distributors are pessimistic over prospect of disruption to mill production schedules should there be a coal strike in July. Pattern of warehouse steel demand is unchanged, with pressure for deliveries continuing to increase for alloy merchant and cold-finished carbon and alloy bars, and hot and cold-drawn tubing. The price spread on floor plates of 10 cents has been eliminated here with all distributors quoting $5.75 for country delivery and $5.90 for city delivery.

Philadelphia — Jobbers report a slight easing in tonnage from the mills and in most cases claim, as a result, that business so far this month is down from the May rate, both with regard to tonnage and dollar volume.

Cincinnati — Mill customers whose allotments of steel for third quarter

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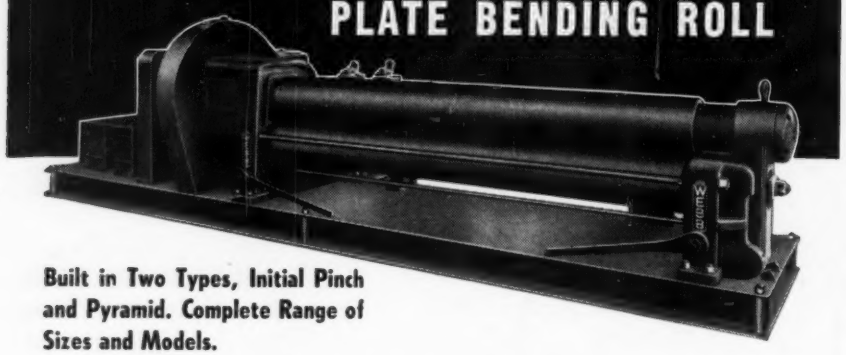

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were cut are adding to the demands on warehouses which, in turn, are likewise hit by reduced mill shipments. Flat-rolled products cannot be kept in stock, the supply being far from requirements. Prices are none too stable.

Birmingham — Warehouses are receiving a minimum amount of steel from all sources. Warehouse allocations here are the slimmest of all time and inventories are at an alarmingly low ebb. On the average, warehouse sources report, many more orders are declined than are filled, most of the latter on a partial basis only.

Metallurgical Coke . . .

Connellsville beehive foundry coke prices rise 25 cents a ton

Metallurgical Coke Prices, Page 124

Pittsburgh—Threat of a coal strike early in July has resulted in a scramble for very limited supplies of coke. A further increase of 25 cents a net ton for Connellsville beehive foundry coke has developed with bulk of tonnage now moving within price range of $14.50 to $16.50. Coke operators are closely watching progress of coal mining contract negotiations and believe that eventual agreement will result in still higher coal prices. In view of this, coke operators are accepting new orders only on the basis of prices in effect at time of shipment.

Sale of Domestic Coke Corp. to Sharon Steel sometime ago has forced foundries to rely to greater extent on beehive coke in this area. Beehive coke and foundry operation will be adversely affected during the miners' vacation period from June 28 to July 6.

Pittsburgh—Shortage of beehive coke will force the United States Steel Corp.'s subsidiaries to lose the equivalent pig iron output of five blast furnaces, or nearly 4000 tons, during the vacation to be taken by coke operators starting June 26. Loss in ingot output will represent one-third less than iron.

Pig Iron . . .

Pig Iron Prices, Page 124

New York — Mandatory government controls on steel for defense work, as recently provided by a clause in the new draft bill, are believed to apply to pig iron as well as to steel. Pig iron is surely as critical an item as any in the entire category of iron and steel products. However, the trade is awaiting further clarification on the point from Washington.

In any event, the trade looks for no immediate disruption as it doubts the defense program will get under way much before the latter part of this year, assuming, of couse, no particularly untoward development occurs abroad meanwhile.

District melt is being sustained this month at a higher rate than in May, as the adverse effects of the coal strike this spring wear off. What the situation will be next month will depend largely upon the outcome of present contract negotiations in coal. Should another coal strike occur in July, pig iron shipments would reflect it rather quickly. Even though the coal dispute is settled amicably, district melt should ease off somewhat as a result of vacations. Many foundries are planning to be closed down (although with a force present to handle incoming shipments of needed materials) during the first week in July and possibly longer.

Boston — Foundry consumers of pig iron are unable to get enough tonnage to increase the abnormally-high ratio of scrap in melts. There is no additional iron in sight beyond Mystic production and that furnace is experiencing difficulty in getting capacity output. Foundry melt losses are high, 30-35 per cent in spots, against a normal of five per cent or less. These losses sometimes do not appear in castings until machining has progressed materially. Seven or eight district foundries are expected to qualify under the housing allocation program, including malleable shops making fittings.

Mystic Iron Works has posted a price of $48.75, f.o.b. Everett, Mass., for No. 2 foundry iron for the third quarter, an increase of $3.75 from the price which had been in effect during the past year under the five-year plan with foundries in New England.

Pittsburgh — Many foundries plan

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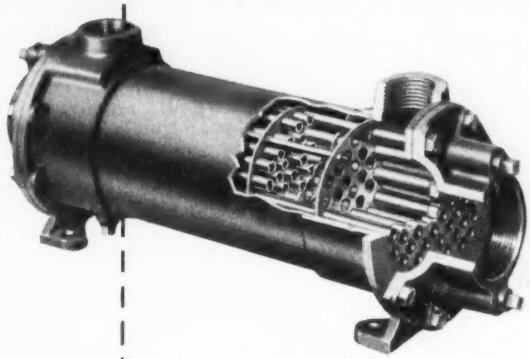

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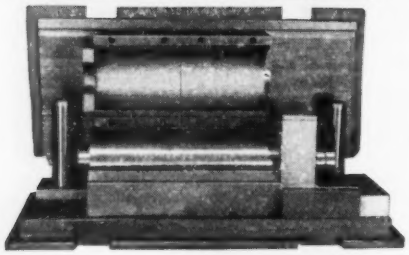

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STEEL PLATES

W. J. HOLLIDAY & CO. 92 1850 YEARS of STEEL 1942

to shut down their plants early in July to coincide with the coal miners' vacation period. Beehive coke operations may be adversely affected during the same period and certainly would be should a coal strike develop later in the month. Early banking of blast furnaces is indicated should such a coal strike develop. Supply of pig iron is not likely to record significant improvement for months to come. Because of this situation, both pig iron and foundry interests generally are against establishment of allotment quotas to preferred foundries serving the housing industry. Gray iron foundry interests report continued decline in new orders but are hopeful this situation will be reversed when their customers can step up production schedules, which are now restricted by limited supplies of other metals.

Philadelphia — District pig iron buyers are winding up a difficult month in point of supply. The situation has been made particularly complicated by the recent unexpected suspension of the merchant furnace at Swedeland, Pa. This suspension probably will continue until mid-August.

Buffalo — Following the move of the nearest competitive point in Ohio, a leading silvery iron producer in this area boosted the silvery price here $4 a ton. No action was taken on merchant iron. Complaints are piling up from foundries which have been increasing their cast scrap melt because of insufficient supplies of pig iron. In many instances, the ratio is running from 75 to 80 per cent cast and from 20 to 25 per cent pig iron. As a result, a large volume of castings have been rejected by consumers.

Lack of raw materials continues to trouble producers. Coke is the big problem. The Bethlehem Lackawanna plant is now receiving many carloads of Swedish ore. The Lackawanna plant is rushing a relining job on an idle stack which may be back in operation shortly after the first of the month.

Chicago — Demand for pig iron and coke is tremendous and about as large as it has been at any time in recent years. Sellers are pressed constantly to speed shipments and increase quotas. During the first two weeks of July many foundries will be closed down for vacation, but they will accept all raw materials shipments and hope to build some inventory. In a few instances, wnere shops are closed by strikes, the operators insist upon getting their regular shipments of iron and coke. With Carnegie-Illinois Steel Corp. lighting the second of two new blast furnaces at South Chicago on June 20, the district now has 43 stacks, of which 40 are operating.

Cincinnati — The district pig iron melt will be considerably lighter during July as foundries shut down for vacations, meanwhile hoping to build pig iron stocks. Prospects of an expanded output of northern iron will help to restore shipments to the level attained early this year, but it was considered unlikely quotas will soon be increased therefrom. The question of an uninterrupted fuel supply, of course, is of paramount interest.

Birmingham — The shortage in pig iron is second only to that in semi-finished steel. One large cast iron pipe manufacturer reports a gradual tightening of supplies, although it had been anticipated that the vacation period, scheduled generally for this month and next, would have brought at least temporary relief. Major portion of southern produced iron, however, is being used in this territory.

Scrap . . .

Price tone remains firm with new contracts placed at formula levels

Scrap Prices, Page 128

Pittsburgh—Recent scrap purchases by leading consumers remain restricted to small lots at formula price basis. However, there appears to be developing a stronger price tone, reflecting higher prices obtained for scrap in the East. Mills are accepting all scrap tonnage offered at formula prices, but have been unable to obtain large tonnage commitments at these price levels.

Recent B. & O. and Pennsylvania Railroad scrap lists brought $1 a ton more for railroad specialties at a range of $55 to $56. With mills absorbing nearly all the bar crops and plate scrap resulting from internal operations, electric furnace operators and steel foundries have been forced to substitute railroad specialties for these items.

Good quality malleable cast scrap is still selling at a premium, within range of $68 to $70. However, some weakness is reported in No. 1 cupola cast, with price range of $63 to $65 prevailing. Foundries continue to complain about poor quality of cast scrap being shipped as No. 1 cupola and have endeavored to remedy this situation through rejecting shipments which do not measure up to specifications.

Overall supply of scrap continues very scarce, with further tightening in supply indicated throughout July as the result of mass vacations among metalworking companies. Mills are no longer able to build up their inventories, as was the case during April and May. This situation is being closely watched by trade leaders because of the importance of augmenting stocks at this time to offset normal curtailment in scrap collection and segregation during the winter months.

New York—Brokers' buying prices are unchanged, although the market undertone is stronger in all grades except cast. Increasing firmness, which is noticeable particularly in the open-hearth steel grades, is ascribed to a generally slower movement, with collections likely to be even lighter during the hot summer months of June and July.

Philadelphia — While scrap prices are unchanged, there is further shrinkage in tonnage. Collections are coming in more slowly and yards are working on inventories in an effort to maintain shipments to consumers at as high a level as possible. Collections next month are expected to be even lighter what with various scrap generating plants curtailing operations

for vacations and with scrap collectors in many cases turning to other seasonal lines of work or taking vacations themselves.

Detroit—Tapering of foundry activity in this district because of a strike in local tool and die shops has meant a further weakening of demand for cast scrap which is now quoted nominally at $53 to $58 per ton for No. 1 cupola cast. The tool and die strike has halted activity on tools for new models, but should occasion no great distress if not prolonged. Employers have offered an increase of 11 cents an hour and the union rejected it, despite the fact hourly rates are the highest here of any area in the country for similar work. Weakness also has developed in blast furnace material as a result of a boycott in some areas on Detroit blast furnace scrap because of subgrade material resulting apparently from deliberate contamination.

Chicago — Scrap prices are unchanged here, but the market is displaying a considerably stronger tone. Steel mills are melting scrap at high rate and consequently, are active in acquiring material. However, the supply falls short of demand, and mills are unable to lay down inventory. Foundry grades are commanding top prices in the bracket, but less desirable grades have slumped somewhat in the past few days, selling for up to $10 off. Foundries have slackened in their buying of these grades. Railroad grades of scrap are still strong, but a considerable portion of the total is allocated to mills and moving at formula prices.

Buffalo — Dealers are taking new orders for heavy melting steelmaking scrap at the formula price of $39.75 a ton as old contracts calling for the same price are completed. Strength marks trading in the steelmaking grades as consumers maintain firm formula bids for whatever tonnage dealers can offer. Augmenting the firm undertone at the formula price is the fact that outside buying by two Pittsburgh area consumers goes on unabated in the midstate section at prices which average about $1.50 above the formula.

The recent movement of scrap to consumers here has been heavy as mills are striving to build up reserves, but dealers anticipate a falling off in supplies due to a decrease in industrial scrap accompanying mass vacations at many plants.

Cast scrap continues to favor the easier side of the market due to the inability of foundries to obtain adequate pig iron shipments. Cast prices, however, hold within a range of $60 to $65, depending on quality.

Cincinnati—Scrap prices are unchanged. Most melters are fairly well supplied for current needs, but are taking offerings at established price levels. Lack of more aggressive buying may stem from uncertainties in the fuel supply outlook. However, the undertone is strong, based on need to build up inventories against next winter's needs. Collections of country scrap tend to taper from earlier volume.

Birmingham — No major volume of scrap purchases has come to light over the past few days, although the aggregate movement is said to be substantial. Some observers believe a general buying movement in scrap is in early prospect as efforts get under way to build up stockpiles for the winter months. Prices remain unchanged.

Seatle—Steel scrap is arriving in fair volume at tidewater. Receipts will be larger in the near future as transportation facilities with the Portland area are restored. Mills expect to build up fair inventories during the summer. Dealers in shop turnings and mixed borings are unable to supply the demand here. One local consumer could use 1,500 tons monthly but the amount available from shops over Washington state does not exceed 1000 tons per month. Much of this material comes from the Puget Sound Navy Yard. Prices are firm at $19 minimum with $21 or more maximum. The market is very firm. Cast iron scrap is also firm at a minimum of $40, demand in excess of supply.

Pacific Associates Inc. formed by the Alaska Junk Co., Dulien Steel Products Co., Pacific Tractor & Equipment Co., Tieton Metals Co. and California Bag & Metals Co., has purchased about 22,000 tons of surplus Army and Navy equipment on Attu island. An initial shipment of 4000 tons was sold as mill scrap. The material includes jeeps, trucks, tractors, graders, compressors and clothing, and will be brought here by water shipment for resale.

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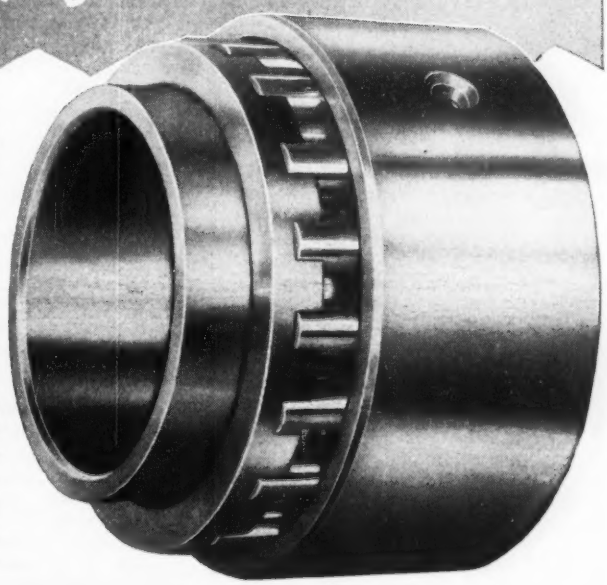

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Refractory Brick Priced f.o.b. Mill

Base prices generally are unchanged, but now apply to point of production rather than that of shipping. Schedule of extras for special shapes revised

Pittsburgh — Refractory brick producers have revised their pricing practice to an f.o.b. producing point basis. In general the base price per thousand units (9-inch straights and series) has not been revised except where freight equalization formerly was involved. Each company within the industry also has set up an entirely new listing of premiums or extras for special shapes. As far as can be determined at this time, there is no similarity in the extra charges among the various producers. In view of the indicated wide range in extra charges, it will be some time before consumers will be able to accurately determine delivery prices for the numerous grades of refractories as quoted by the various producers.

The above action taken by refractory brick interests was prompted by a FTC order to cease and desist from a combination and conspiracy to fix prices and eliminate competition within the industry. Under the new method of selling, "phantom freight" has been completely abolished, as well as equalizing freight charges to meet competitors' basing point prices nearest to consumers.

Price details for all the refractory brick producers should be available within the near future. The following data represent the new base prices for 9-inch straights and series per thousand units as established by General Refractories Co., Philadelphia, June 22.

Super duty fire clay brick—Missouri, $92 f.o.b. St. Louis.

High heat duty fire clay brick—Pennsylvania, $73, f.o.b. West Decatur, Beech Creek and Orviston, $78 f.o.b. Salina. Ohio, $73, f.o.b. Oak Hill. Missouri, $73, f.o.b. St. Louis. Kentucky, $73, f.o.b. Olive Hill, Hitchins, and Haldeman. Georgia, $73, f.o.b. Stevens Pottery. Texas, $73, f.o.b. Troup.

Intermediate heat duty clay brick—$67, f.o.b. all points listed under high duty except Salina and Philadelphia.

Low heat duty clay brick—$59, f.o.b. all points listed under high heat duty brick except Salina and Philadelphia.

Malleable bung brick—Kentucky, $83, f.o.b. Olive Hill. Missouri, $83, f.o.b. St. Louis.

Silica brick — Pennsylvania, $73, f.o.b. Mt. Union, Clayburg and Sproul. Utah, $88, f.o.b. Lehi. California, $88, f.o.b. Los Angeles. Western, $82, f.o.b. Joliet, Ill. Ohio, $73, f.o.b. Portsmouth. Company also sells Yough silica brick at $77, f.o.b. Childs, Pa.

Basic brick — chrome and chemically bonded chrome, $64 a net ton, f.o.b. Baltimore; magnesite, $86, f.o.b. Baltimore; and chemically bonded magnesite, $75, f.o.b. Baltimore. Unburned magnesite, $81 f.o.b. Los Angeles; chrome brick, $70 f.o.b. Los Angeles.

Domestic dead-burned standard 3/8-inch grains magnesite—bulk, $56.50; single paper bags, $62.50, f.o.b. Baltimore; Chewelah, Wash., $31 for bulk and $35.50 in single bags. Company increased its magnesite brick price $4 on May 5.

Producers of ladle brick continue to sell their product f.o.b. production point.

Harbison-Walker Refractories Co., this city, has issued a new classification of extras for special shapes, effective June 25, and is now selling its products on the basis of f.o.b. producing point with the establishment of $78, f.o.b. Hays, Pa., for silica brick.

U. S. Lake Ships Carry Record Peacetime Freight

Persistently boring into their tremendous 1948 cargo schedules, Great Lakes freighters carried 21,187,049 net tons of iron ore, coal and grain during May, the biggest total for any like month since the war, according to the Lake Carriers' Association, Cleveland. The 11,609,367 tons of iron ore for May comfortably exceeded April's record haul of 7,677,270 tons, and indicated the fleet has pulled out all the stops in its season's effort. Total ore movement as of June 1 totaled 19,286,548 tons, exceeding ore movement for the total season of 1932 and 1938 and approaching the season totals for 1931, 1933 and 1934.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1000 tons, Oregon State College pavillion, Corvallis, to Bethlehem Pacific Coast Steel Corp., Seattle; J. G. Watts Construction Co., Seattle, general contract.

350 tons, plant addition, Behr-Manning Division, Norton Co., Troy, N. Y., to West Side Structural Co., Troy; Morton C. Tuttle Co., Boston, general contractor.

230 tons, sorting bins and hoppers, Allied Mills Inc., Buffalo, and Ft. Wayne, Ind., to Lackawanna Steel Construction Corp., Buffalo, and Ft. Wayne Structural Steel Co.; James Stewart Corp., Chicago, contractor.

200 tons, miscellaneous school projects, Washington state, to Isaacson Iron Works, Seattle.

153 tons, bridge, sec. 32R-F, Woodford county, Ill., for state, to Bethlehem Steel Co.

146 tons, bridge, Sec. SO3841, Outagamie county, Wis., for state, to Bethlehem Steel Co.

100 tons, state bridge, Rutland, Vt., to Vermont Structural Steel Co., Burlington, Vt.

Unstated, expansion, Warner Gear Division, Borg-Warner Corp., Muncie, Ind., to Indiana Bridge Co. Inc., Muncie, Ind.

Unstated tonnage, radial gates, Bureau of Reclamation, Denver, spec. 2137, to American Bridge Co., $298,068.

STRUCTURAL STEEL PENDING

8500 tons, first section, state express highway, East Boston, Mass., V. Barletta Co., Boston, low on general contract.

3880 tons of tunnel supports and 422 tons of shapes, state bridge and tunnel construction

and affiliated work, Pittsburgh, bids July 23; project also requires 2623 tons of reinforcing bars, 300 tons of wire mesh reinforcement, 208 tons of miscellaneous iron and steel and 41,775 linear feet of galvanized steel conduit.

3700 tons, state bridge, Shelton and Derby townships, Connecticut; bids July 19.

2040 tons (also 500 tons reinforcing) Washington state bridge, Wenatchee; bids at Olympia advanced to June 25 from June 18.

1200 tons, galvanized transmission towers, Tacoma light department; bids in June 21.

740 tons, coal preparation plant, Maumee Collieries Co., Keller, Ind.; bids June 24.

575 tons, highway bridge, Forebay channel, Davis dam, Bureau of Reclamation, Denver; bids July 15 on steel direct.

400 tons, state lift bridge, Millville, N. J.; bids closed June 23.

360 tons, three-span state highway bridge, Beverly, Mass.; bids June 29, Department of Public Works, Boston.

307 tons, state bridge, Clearfield county, Pennsylvania, bids July 2.

170 tons, state bridge, Washington county, Rhode Island; bids June 30.

100 tons, approximately, engine test facilities, Navy yard, Philadelphia; bids asked.

100 tons, Pennsylvania railroad bridge, Kokomo, Ind.; bids closed June 18.

Unstated, University of Washington rowing shell house, steel frame; $350,000 project; bids to regents, July 8.

Unstated, trash racks, bulkhead gates, etc. outlet works, Yakima project; bids to Bureau of Reclamation, Denver, July 8.

Unstated, miscellaneous structures. Coulee power plant; bids to Bureau of Reclamation, Denver, July 6.

Unstated, tier logs, rubber seals, Coulee dam; bids to Bureau of Reclamation, Denver, July 15.

Unstated, lattice pole type steel towers and anchorages, Midway-Hanford transmission line; bids to Bonneville Power Administration, Portland, Oreg., June 25.

Unstated, four 80" flap gates, Boise project; bids to Bureau of Reclamation, Denver, July 20.

REINFORCING BARS . . .

REINFORCING BARS PLACED

200 tons, J. Finkel Mfg. building, 16th Ave., between 61st and 62nd Sts., Brooklyn, N. Y., through Pioneer Engineering Corp., Jersey City, N. J., to Capitol Steel Corp. of New York, New York city.

200 tons, miscellaneous construction jobs, to Northwest Steel Rolling Mills Inc., Seattle.

185 tons, addition, Swedish-American Hospital, Rockford, Ill., to Ceco Steel Products Corp., Cicero, Ill.; Gust W. Nelson, Rockford, Ill., contractor.

140 tons, grade school, Anacortes, Wash., to Northwest Steel Rolling Mills Inc., Seattle.

119 tons, telephone exchange, Middle States Telephone Co., Park Ridge, Ill., to Joseph T. Ryerson & Son Inc., Chicago; Schillinger Bros. Co., Chicago, contractor.

102 tons, disposal plant, Bellingham, Wash., to Northwest Steel Rolling Mills Inc., Seattle.

100 tons, dormitory building, Watchtower Bible & Tract Society Inc., 128-136 Columbia Heights, Brooklyn, N. Y., through Skinner, Cook & Babcock Inc., 60 East 42nd St., New York, to Capitol Steel Corp. of New York, New York city.

100 tons, Southwest Side Intercepting sewer, cont. 12-A, for Sanitary District of Chicago, to Carnegie-Illinois Steel Corp., Santucci Construction Co., Skokie, Ill., contractor.

100 tons, Christian Church Service hospital, Nome, Alaska, to Northwest Steel Rolling Mills Inc., Seattle; Carson Construction Co., Helena, Mont., general contract.

REINFORCING BARS PENDING

13,200 tons, sch. 1, siphon, Columbia Basin

Forming die . . . made from "HSC 265" air hardening alloy steel. Preferred for its wear resistance (die illustrated ran up to ¼ million pieces before dressing) . . . its resistance to warping and distortion in heat treating.

An unusual assortment of fine tool steels . . . in various sizes, shapes, finishes, conditions . . . available promptly from the conveniently located warehouses of Hoyland Steel Company. Complete technical assistance in solving tool steel problems. Hoyland Steel Catalog-Work Book available on request.

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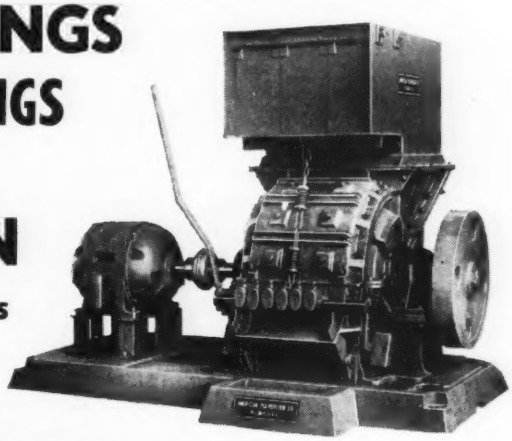

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Patented manganese shredder rings, revolving free on individual shafts, prevent clogging and damage to crusher from tramp iron.

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Originators and Manufacturers of Ring Crushers and Pulverizers

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ST. LOUIS 10, MO.

project, Soap Lake, Washington; bids to chief engineer, Bureau of Reclamation, Denver; under alternate sch. two, 5900 tons are required.

2635 tons of reinforcing bars and 300 tons of wire mesh, state bridge and tunnel development, Pittsburgh, bids July 23; project will also require 3880 tons of permanent tunnel steel supports and 422 tons of structural shapes

1050 tons, canal and headworks, Columbia Basin project, near Stratford, Wash.; bids to chief engineer, Bureau of Reclamation, Denver.

900 tons, state road work and bridge approaches, Linden, N. J.; bids July 7.

360 tons, office building and warehouse, Horder's Inc., Chicago; bids June 15.

180 tons, school, St. John the Baptist, Whiting, Ind.; Roy C. Clark Inc., East Chicago, Ind., contractor; bids June 1.

100 tons, three slab and girder highway bridges Skagit county, Washington; bids to Olympia, July 2.

PLATES . . .

PLATES PLACED

170 tons, Navy, inv. 5913, to Bethlehem Steel Co.

Unstated tonnage, steel water tank and tower, veterans' hospital, Marlin, Tex., to Chicago Bridge & Iron Co., Chicago, $51,300.

PLATES PENDING

3000 tons, sch. 1, siphon, Columbia Basin project, Soap Lake, Washington; bids to chief engineer, Bureau of Reclamation, Denver; under alternate sch. two, 12,700 tons are required.

Unstated, four penstocks, two 96 inch outlet pipes, Hungry Horse dam, Montana; bids to Bureau of Reclamation, Denver, July 13.

Unstated, steel sheet piling for 2420-foot breakwater, Astoria, Oreg.; bids to U. S. Engineer, Portland, Oreg.

Unstated, main pipe line, Lewiston Orchards project; bids to Bureau at Lewiston, Ida., July 13.

PIPE . . .

CAST IRON PIPE PENDING

870 tons, bell and spigot, for local projects; bids opened by Seattle, June 18.

STEEL PIPE PENDING

Unstated, 10 inch steel pipe for water system state reformatory, Monroe, Wash.; general award to Blake-Thompson Construction Co., Mt. Vernon, including steel reservoir.

RAILS, CARS . . .

RAILROAD CARS PLACED

Atchison, Topeka & Santa Fe, 750 box cars, 50-ton capacity, to be built in its own shops.

Missouri Pacific, 1000 seventy-ton hoppers to Bethlehem Steel Co., Bethlehem, Pa., and 1000 seventy-ton gondolas to own shops, De Soto, Mo.

Nashville, Chattanooga & St. Louis, 1000 fifty-ton hoppers, to Pullman-Standard Car Mfg. Co., Bessemer, Ala.

Southern Pacific, 30 stainless steel sleepers, to Budd Co., Philadelphia.

RAILROAD CARS PENDING

Delaware & Hudson, 100 seventy-ton covered cement cars, pending.

Canadian National 10 caboose cars, pending.

St. Louis-San Francisco, 70 seventy-ton hopper cars, pending.

LOCOMOTIVES PENDING

Southern Pacific, 95 diesel-electric freight locomotives, to cost about $25 million.

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●Handles intricate cuts easily. No distortion. Unusually strong and durable, geared to give great power with little effort. Metal can turn any direction while cutting.
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CONSTRUCTION AND ENTERPRISE

CALIFORNIA

SANTA CLARA, CALIF.—Owens-Corning Fiberglas Corp., 608 Madison Ave., Toledo, O., has awarded a $450,000 contract to Austin Co., Cleveland, for the second unit of a factory.

SAN FRANCISCO—Electric Mfg. Co., 34 Dore St., plans a $100,000 plant addition.

FLORIDA

DANIA, FLA.—Ribbonwriter Corp. of America, c/o Claus R. Moberg, architect, First National Bank Bldg., Hollywood, has awarded a $100,000 contract to Weller Construction Co., 918 N. Twentieth Ave., Hollywood, for erection of a factory and office building.

ILLINOIS

CENTRALIA, ILL.—City plans a $257,000 project to include a building, equipment, auxiliaries and appurtenances of a water works filtration plant.

CHAMPAIGN, ILL.—General Electric Co. has awarded a $1,200,000 contract to Steinle-Welde Co., Fremont, O., for construction of a factory for the manufacture of bases for fluorescent lamps.

INDIANA

INDIANAPOLIS — American Foundry Co., Blaine Miller, president, 1535 Naomi St., will build a $3 million manufacturing plant.

INDIANAPOLIS—Western Electric Co., 195 Broadway, New York, plans to build a $25 million plant on Shadeland Dr. between 25th St. and the Big Four Railroad.

INDIANAPOLIS—Diamond Chain Co., 402 Kentucky Ave., has awarded an $800,000 contract to Carl M. Geupel Construction Co., Hume Mansur Bldg., for erection of two plant additions.

RICHMOND, IND.—Crosley Division, Avco Mfg. Co., has awarded a $900,000 contract to Ferro Concrete Construction Co., Third St., Cincinnati, for erection of a warehouse for refrigerators.

MICHIGAN

IRON MOUNTAIN, MICH.—Wisconsin-Michigan Power Co., 137 W. Mill St., Appleton, Wis., will build a dam and power plant on the Messominee river near here at a cost of $2 million.

MINNESOTA

ST. LOUIS PARK, MINN.—Minnesota Rubber Gasket Co., 6505 Minnesota Ave., has awarded a $68,000 contract to E. Martinson, 4440 Washburn Ave. S., Minneapolis, for construction of a factory at 36030 Wooddale Ave.

MISSOURI

ST. LOUIS—U. S. Atomic Energy Commission, Bremen Station, plans to build a 2-story plant at 65 Destrehan St.

ST. LOUIS—Washington University has awarded a $69,000 contract to Wells & Wells Inc., 420 Security Bldg., for construction of an addition to its cyclotron and radio chemistry building.

NEW JERSEY

METUCHEN, N. J.—Socony Paint Products Division, Socony-Vacuum Oil Co. Inc., 111 Broadway, New York, has awarded a $3 million contract to Walter Kidde Constructors, 140 Cedar St., New York, for erection of a paint plant here.

OHIO

CLEVELAND—Jones & Laughlin Steel Corp., Jennings Rd., will soon let a contract for a foundation for a blooming mill.

WELCO Collector Rings are made in all sizes to carry currents of 5 to 200 amperes. Two to twelve rings can be furnished on one stub complete with brush holders, brushes, studs for supporting the brush holders and stud rings. The collector rings can be assembled as a unit on one hollow tube with threads on one end and insulation bushing on the opposite end. The brush holders carrying the current are made of brass. The collector rings are made of hard bronze material. Bakelite insulation is used.

Welco Collector Rings are custom-built to fit the special design and functional requirements of your machines or equipment. A limited number of standard types are available. Send us your blueprints and we will design for you the collector rings that are functionally correct.

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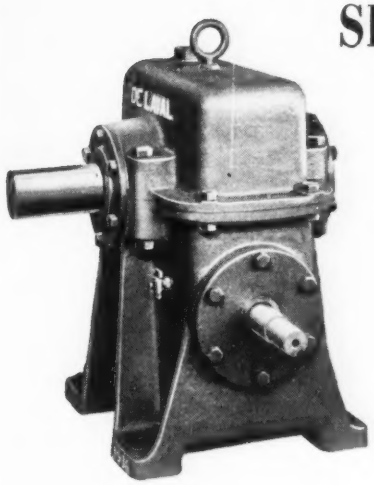

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Reducer	*Ratio*	*Probable *HP Motor*	*Reducer*	*Ratio*	*Probable *HP Motor*
BW400	92⅔	5	BW600	112⅔	10
BW400	19½	3	BW600	19½	7.5
BW400	25	2	BW600	25	5
BW400	40	1.5	BW600	40	3
BW500	112⅔	7.5	BW700	92⅔	15
BW500	19½	5	BW700	19½	10
BW500	25	3	BW700	25	7.5
BW500	60	1.5	BW700	40	5

** Based on 1750 rpm—A.G.M.A. Class 1 Service. For other rpm's or Service refer to De Laval rating tables.*

Other sizes and ratios, in both single and double reductions, and in vertical and horizontal drives, also can be furnished promptly.

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Pittsburgh, Pa. Court 5400
Rochester, N. Y. Stone 6950
St. Paul, Minn. Garfield 1836
Salt Lake City, Utah Salt Lake City 3-7933
San Francisco, Calif. Sutter 3426
Seattle, Wash. Elliott 3437
Tulsa, Okla. Tulsa 5-2151
Washington, D. C. National 9238

DE LAVAL STEAM TURBINE CO.
TRENTON 2, NEW JERSEY

CLEVELAND—Bailey Meter Co., 1050 Ivanhoe Rd., has awarded a $205,000 contract to Sam W. Emerson Co., 1836 Euclid Ave., for construction of a factory addition.

OKLAHOMA

CUSHING, OKLA. — Midland Co-operative Wholesale Co. has awarded a $500,000 contract to Refinery Engineering Co., 10 E. Fourth St. Bldg., Tulsa, for construction of a refinery expansion.

PENNSYLVANIA

PHILADELPHIA—Gulf Oil Corp., 1515 Locust St., will spend $1 million on refinery expansions.

SPRINGDALE, PA.—Tubular Service Corp., 34 Broadway, New York, has awarded a $150,000 contract to M. B. Parker, 732 Bakewell Bldg., Pittsburgh, for repairs and alterations to eight buildings.

TEXAS

CORPUS CHRISTI, TEX.—Southwestern Oil & Refining Co., Port and Sommers St., has awarded a $3,750,000 contract to Process Engineers Inc., 409 Ross Ave., Dallas, for the design and construction of a refinery plant near here.

DALLAS, TEX.—Atlantic Refining Co. has awarded a $3 million contract to Henry C. Beck Co. for construction of an office building.

HOUSTON, TEX.—Union Wire Rope Corp., 5803 Navigation Blvd., has awarded a $70,000 contract to Mecca Engineering & Construction Co., 2026 Harold St., for erection of a shop.

HOUSTON, TEX.—McClan Co., John F. McComb, president, has an option on four acres in New Hempstead Highway-Post Oak Road industrial area and plans to construct an office building, factory and warehouse at a cost of $100,000.

MIDLAND, TEX.—Texas Pipe Line Co., Texas Co. Bldg., Houston, has awarded a $286,000 contract to Brown-Lane Co., Amarillo, for construction of a pumping station near here.

PAMPA, TEX.—Cities Service Oil Co. has awarded a $1,250,000 contract to Walco Engineering & Construction Co., 2408 E. Fourth Place, Tulsa, Okla., for modernizing and redesigning a natural gasoline plant for ultimate processing of 18 million cu ft of gas daily.

REALITORS, TEX.—Coast Oil Co., c/o Paul Conly, Alice, will build a $200,000 pressure maintenance plant.

UTAH

SALT LAKE CITY, UTAH—Structural Steel & Forge Co., 545 W. Seventh St., and Penn Tool & Machine Co., Danville, Ill., will build a $1 million steel pipe manufacturing plant for fabricating water, gas, oil and well casing pipe from 10 to 36-in.

WASHINGTON

VANCOUVER, WASH.—Carborundum Co., Niagara Falls, N. Y., has awarded a $2,500,000 contract to Blaw-Knox Co.'s Chemical Plants Division, Pittsburgh, for construction of an abrasive furnace plant here.

WISCONSIN

MILWAUKEE—Milwaukee Electric Co., 231 W. Michigan Ave., Chicago, plans to build a substation here at a cost of $529,000, and another at Racine costing $119,500.

MILWAUKEE—Milwaukee Valve Co., 2375 S Burrell St., has awarded a $75,000 contract to Ed. Steigerwald & Sons, 5310 W. State St., for construction of the foundation of a 2-story factory.

MILWAUKEE—Wisconsin Gear Co., 3844 N Third St., has awarded a $75,000 contract to Hunzinger Construction Co., 4541 N 124th St., for the erection of a factory addition.

RACINE, WIS.—Twin Disc Clutch Co., 1328 Racine St., plans a warehouse addition.

CANADA

WINNIPEG, MAN.—Globelite Batteries Ltd., 146 Alexander Ave., has awarded a $250,000 contract to Smith & Fredborg, 143 Portage Ave., for construction of a factory.

COBALT, ONT. — New Casey Cobalt Silver Mines Ltd., 100 Adelaide St. W., Toronto, will spend $110,000 on mine improvements.

LONDON, ONT.—Richards Wilcox Canadian Co. Ltd. will build a 1-story factory addition at a cost of $100,000.

MIDLAND, ONT.—Bausch & Lomb Optical Co. Ltd., 3888 Yonge St., Toronto, has awarded a $75,000 contract to Mollenhauer Contracting Co., 188 Perth Ave., Toronto, for construction of a plant unit.

TORONTO, ONT.—Dominion Tar & Chemical Co. Ltd., Sun Life Bldg., Montreal, has awarded a $125,000 contract to A. W. Robertson Ltd., 57 Bloor St. W., for construction of a plant addition.

NORTH WEST TERRITORY—Ventures Ltd., 25 King St. W., Toronto, Ont., will spend $200,000 on a lead-zinc deposit development at Great Slave Lake.

PRICES OF LEADING FERROALLOYS PRODUCTS

(Concluded from Page 125)

c.l. and 0.9c for l.c.l.; Western, add 0.35c for c.l. and 1.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Eastern Zone, contract, carload, bulk, 8.7c per lb of briquet, c.l. packaged 9.5c, ton lot 10.3c, less ton 11.2c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Eastern Zone, contract, c.l. bulk 8.75c per lb of briquet, c.l. packed 9.55c, ton lot 10.35c, less ton 11.25c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (**Large size**—weighing approx. 5 lb and containing exactly 2 lb of Si). Eastern Zone, contract, carload, bulk 5.1c per lb of briquet, c.l. packed 5.25c, ton lot 6.7c, less ton 7.6c. (**Small size**—weighing approx. 2½ lb and containing exactly 1 lb of Si). Eastern Zone, carload, bulk 5.25c c.l. packed 6.05c, ton lots 6.85c, less ton 7.75c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.45c for c.l. and 0.9c for l.c.l. Freight allowed. Add 0.25c for notching, small size only. Spot, add 0.25c.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%). Eastern Zone, contract, carload, lump, bulk 17.50c per lb of alloy, carload packed 19.0c, ton lot 19.8c, less ton 20.8c; Central, add 0.5c for c.l. and 0.85c for l.c.l.; Western, add 2.55c for c.l. and 2.6c for l.c.l. Freight allowed. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Eastern Zone, contract, carload, lump, bulk 16.25c per lb of alloy, carload packed 16.45c, ton lot 19.35c, less ton 20.85c; Central, add 0.5c for c.l. and 0.75c for l.c.l.; Western, add 2.55c for c.l. and 2.90c for l.c.l. Freight allowed. Spot, add 0.25c.

VANADIUM ALLOYS

Ferrovanadium: Open Hearth Grade (Va 50-55%, Si 8% max., C 3% max.). Eastern Zone, contract, any quantity, $2.90 per lb of contained Va; Central, add 2c for c.l. and 3c for l.c.l.; Western, add 6c for c.l. and 9c for l.c.l. Freight allowed. Spot, add 10c. **Special Grade** (Va 50-55%, Si 4% max., C 1% max.), $3. **High Speed Grade** (Va 50-55%, Si 1.50% max., C .20% max.), $3.10.

Vanadium Oxide: All Zones, contract, less carload lots, $1.20 per lb of contained V_2O_5. Spot, add 5c.

Grainal: Vanadium Grainal No. 1, 93c; No. 6, 63c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

TITANIUM ALLOYS

Ferrotitanium: (Ti 20-25%, Al 3% max., Si 4% max., C 0.10% max.). Eastern Zone, contract, ton lot, 2" x D, $1.35 per lb of contained Ti, less ton $1.40. (Ti 40-45%, Al 7% max., Si 4% max., C 0.10% max.). Ton lot $1.23, less ton $1.25; Central, add 4c for 20-25% Ti grade, and 2.1c for 40-45% grade; Western, add 13.5c for 20-25% Ti grade, and 7.2c for 40-45% grade. Freight allowed. Spot, add 5c.

Ferrotitanium, High-Carbon: (15-20%). Contract basis, per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis, 6.8% C, $142.50; 3-5% C, $157.50.

TUNGSTEN ALLOYS

Ferrotungsten: (W 70-80%). Eastern Zone, contract, 10,000 lb W or more, $2.25 per lb of contained W; 200 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Eastern Zone, contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloys: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Eastern Zone, contract, c.l., lump, bulk 6c per lb of alloy, c.l. packed 6.75c, ton lot 7.5c, less ton 8.35c; Central, add 0.25c for c.l. and 1.1c for l.c.l.; Western, add 0.6c for c.l. and 3.95c for l.c.l. Freight allowed. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Eastern Zone, contract, carload, lump, packed 18.4c per lb of alloy, ton lot 19.15c, less ton 20.40c; Central, add 0.6c for c.l. and 1.05c for l.c.l.; Western add 3.05c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Eastern Zone contract, 100 lb or more. 1" x D, $1.20 per lb of alloy, freight allowed. Less than 100 lb $1.30; Central, add 0.75c; Western add 2.9c, freight allowed. Spot, add 5c.

Borosil: (3 to 4% B, 40 to 45% Si), $6.25 per lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

Bortam (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 0.90 to 1.15%). Net ton to carload, 8c per lb, fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Mn 5% max., Si 8% max., C 0.5% max.). Eastern Zone, contract, ton lot, 2" x D, $2.50 per lb of contained Cb, less ton $2.55; Central, add 1.65c; Western, add 6.45c. Freight allowed. Spot, add 10c.

CMSZ Mixes: (No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). Eastern Zone, carload, 12 M x D, carload packed 17.25c per lb of material, ton lot 18.00c, less ton 19.25c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l., and 3.05c for l.c.l. Freight allowed.

Silcaz Alloy: (Si 35-40%, Ca 9-11%; Al 6-8%, Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). Eastern Zone, carload, packed, 1" x D, 39c per lb of alloy, ton lot 41c, less ton 43c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Eastern Zone, contract, carload, packed, ½" x 12 M, 15.0c per lb of alloy, ton lot 15.75c, less ton 17.0c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed. Spot, add 0.25c.

Graphidox No. 4: (Si 56%, Ca 5%, Ti 9%) C.l. packed, 16.50c per lb. of alloy; ton lots 17.90c; less ton lots 19.40c, fob Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%; V-7, Cr 28-32%, Si 15-21%, Mn 14-16%) C.l. packed, 12.95c per lb. of alloy; ton lots 14.60c; less ton lots 15.85c, fob Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al). Packed, lump, carload 10c, ton lots 10.25c, smaller lots 10.75c per lb alloy; freight not exceeding St. Louis rate allowed.

Ferrophosphorus: (17-19% based on 18% P content with unitage of $3 for each 1% of P above or below the base) Gross tons per carload fob sellers' works, with freight equalized with Rockdale, Tenn.; contract price $58.50, spot $62.25.

Ferromolybdenum: (55-75%). Per lb, contained Mo, fob Langeloth and Washington, Pa., furnace, any quantity 95.00c.

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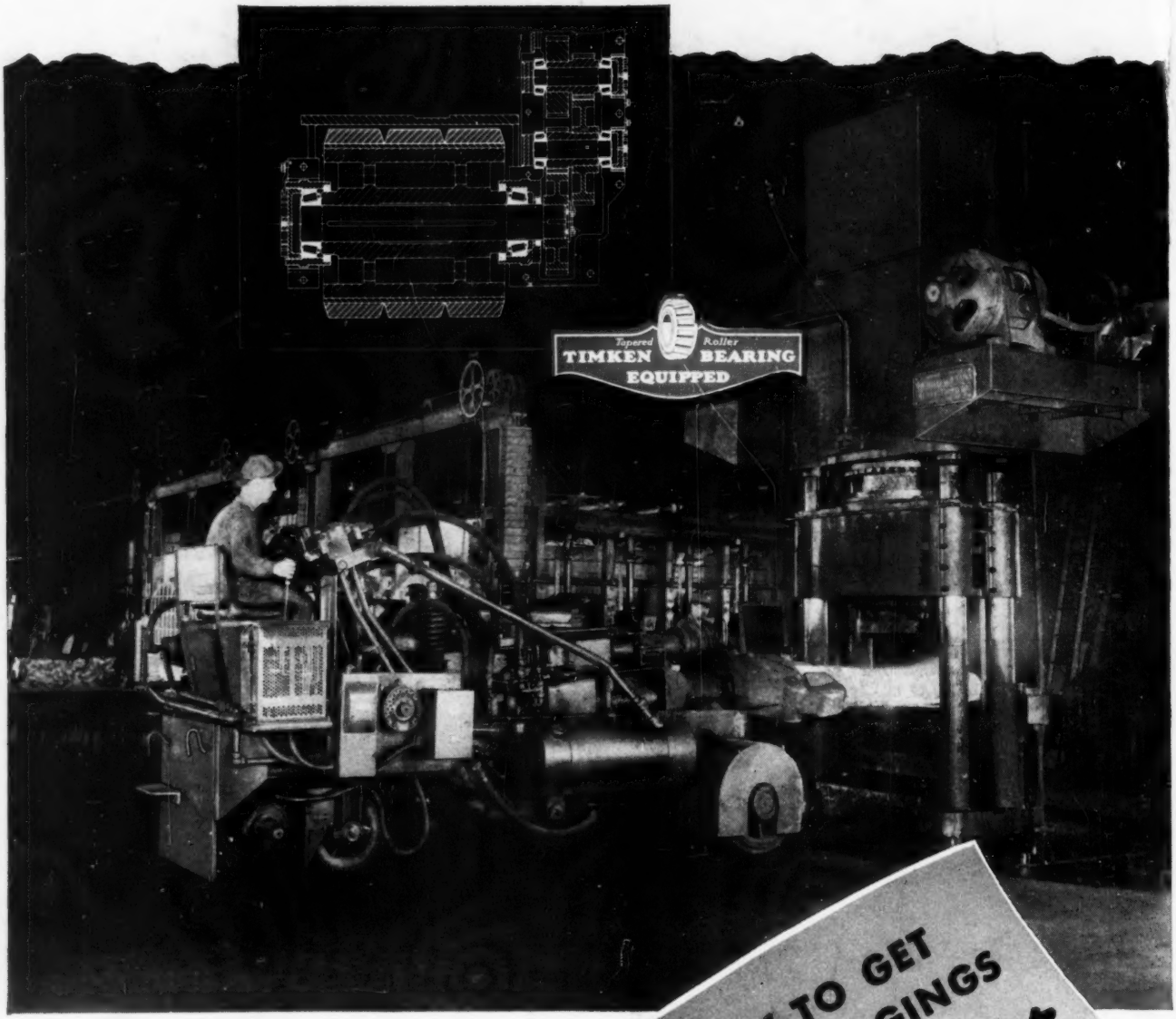

HOW TO GET BETTER FORGINGS at Lower Cost

Assuming that the metallurgical and physical properties of the steel are correct for the service demanded of the forgings you make, getting better forgings at lower cost is largely a matter of modern equipment plus "know how".

The photograph shows a Brosius 6,000 lb. capacity Auto Floor Manipulator manufactured by Edgar E. Brosius Co., Sharpsburg, Pa., serving a 1,000 ton hydraulic forging press manufactured by The Hydraulic Press Manufacturing Co., Mt. Gilead, Ohio, both equipped with Timken tapered roller bearings to facilitate smooth, accurate, economical operation; reduce maintenance and lengthen equipment life.

Sixteen Timken bearings are used in the manipulator, including the wheels and drive mechanism as shown in the drawing. Timken bearings also are used in the hydraulic pump furnishing power to the press — a very exacting application, demanding extreme initial and lasting precision.

Specify Timken bearings for the equipment you buy; look for the trade-mark "TIMKEN" on the bearings that go in the equipment you make. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address "TIMROSCO".

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